

American Iris Society

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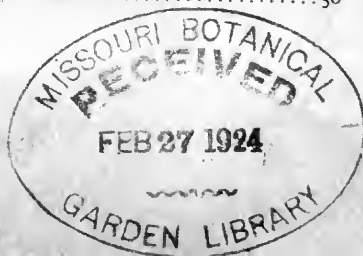
No. 10 ✓

Irises for the Amateur

Edited by the Secretary
R. S. STURTEVANT

CONTENTS

| | |
|---|----|
| The Iris Family and its Native Representatives | 3 |
| Practical Points, <i>R. S. Sturtevant</i> | 5 |
| Sources of Information 5; Hints to Purchasers | 5 |
| Selected Varieties 6; Diseases and Enemies | 12 |
| Abnormal Development | 14 |
| Use in Ornamental Plantings, <i>L. Philibert Lavenir</i> (a free translation) | 15 |
| Varying characteristics of Garden Irises | 20 |
| Hybridization, <i>R. S. Sturtevant</i> | 24 |
| Growing the Bearded Iris, <i>J. Marion Shull</i> | 30 |
| Field Culture, <i>Mm. Bretin et Abrial</i> | 32 |
| On Sowing Iris Seed, <i>J. Marion Shull</i> | 34 |
| Irises in the Garden | 36 |
| Symposium of 1917-1918 Introductions, <i>Clarence P. Connell</i> | 40 |
| The Work of the Society | 42 |
| Cornell Iris Test Gardens, <i>Austin W. W. Sand</i> | 43 |
| N. Y. Botanical Test Garden | 45 |
| Tid-bits, from various members | 46 |
| Announcements | 48 |
| General Index to all Bulletins | 50 |





Siberian Irises Massed in a low part of the Garden, Massachusetts.

The Iris Family and Its Native Representatives

The Iris family with its erect equitant leaves contains not only the iris, but also the crocus, the gladiolus, the Blue-eyed Grass, *Sisyrinchium*, as well as the less well-known *Montbretia*, *Ixia*, *Tigridia*, and *Moraea*, which last takes the place of the iris in the southern hemisphere. The family is subdivided into two large sections: the bulbous irises with corms like the crocus, or even the gladiolus, and a non-bulbous group with more, or less, thick, creeping root-stocks called rhizomes. With the bulbous species we are not greatly concerned because they thrive only in favored gardens; experimentally one may try the winged alata which blooms in January, the more reliable reticulata of April, the Junos of May with their corn-like foliage, and the Dutch, Spanish, and English irises which are unexcelled as cut-flowers, but it is the fortunate gardener who can grow many of these without coddling. The rhizomatous irises, however, are often so easily grown that we may find them run-wild in a moist meadow, or as the sole remnants of a once gay garden.

Even within this subsection our interest is still further limited because the regelia and oncocyclus varieties from Syria and Asia minor respond only to the green-fingered handling of an expert. The hybrids between these and our garden varieties are also of uncertain growth, and the lovely but delicate Californian irises, the crested tectorum, gracilipes, and cristata are all of minor importance. These last present no great difficulties in culture, but they are not adapted to strong competition with other perennials. Try them by all means at the front of the border, or in the rock-garden, but protect them from too rampant neighbors.

Though we thus briefly seem to eliminate many species there still remains a wealth of variety in height and form and color among the garden irises which only need to be stepped on to grow and flourish. Both culturally and botanically, I might say esthetically, as well, they fall into two well-defined groups; bearded and beardless, the first with broad sword-like leaves, the second usually much more grass-like in appearance. The iris flower has six segments, the three upper petals we call standards, the three drooping or spreading sepals falls, and in addition to these there are three style-branches which arch over the pollen bearing stamens and bear on their under side near the extremity a small projecting lip, the stigma. *'The styles form the roof and the haft, or base of the beard, crest, or attractive blotch of color that serves as a distinguishing mark between the different sections of rhizomatous irises. In the Bearded Irises both standards and falls are much of a size, but in the Beardless species the standards are often very small and only in the Japanese are the flowers at all comparable in total size to the Bearded varieties. It is partly for this reason, but perhaps even more from their ease of culture and wide range of color that the Bearded Irises derive their popularity as one of the indispensable hardy perennials.

Native Species: We shall consider elsewhere the exotic irises as many of us will first become acquainted with one of our many native flags. With the exception of cristata, an Evansia, or Crested iris, they all belong to the beardless group.

*Adapted from "Irises" by W. R. Dykes.

California is richest in variety of species and it is unfortunate that practically all of them are difficult to transplant and are not even easy to establish when grown from seed, but if transplanting is to be attempted do it when they are in full growth, preferably as they commence their spring activities.* With the exception of *longipetala* and the closely allied *Tolmieana* all are lime haters. *Longipetala* likes a heavy soil quite moist in winter and dry in summer; *Douglasiana*, *Purdyi* and *bracteata* with less densely clustered rhizomes like moist open woods in soils tending to clay, while the stringy rhizomes of *tenax* prefer a loose porous soil in dry open woods, and *macrosiphon* with its wiry rhizomes enjoys a similar site. They vary in height from six to eighteen inches and the delicate flowers are varied also, white, lavender, pale yellow.

These species we find in humid mountain valleys all along the Western coast, but as we come eastward to the Rocky Mountains only *longipetala* climbs with us and as we cross the divide we come upon *missouriensis* and its variety *montana* in greater and greater profusion. From **Montana** southward to **Arizona** and eastward to **Dakota** this is the one species, typically blue-lavender, but occurring in deep blue and white. There is a rumour of a colony of the old-world spuria in Texas and perhaps the white bearded iris *albicans* which the Moors used in their cemeteries thruout Northern Africa and Spain may have journeyed with the church fathers to the old missions by the Mexican border, but these would be escapes not native species.

To the northward in the great plains *versicolor* the common Blue Flag of the north eastern states is found in moist swamps. From **Illinois** south to **Georgia** and **Texas** the uniquely tawny hued *fulva* occurs and from **Kentucky** south to **Florida** the taller, more lush appearing *hexagona*. *Foliosa* and *Lamancei* in white or purple are forms of *hexagona* while *virginiana* and *caroliniana* are mere local variations of *versicolor* which varies in color from white to blue or red purple. With the exception of the grassy leaved *prismatica* of eastern coastal marshes, the wire leaved *setosa* that pervades the entire sub-arctic region, and the related *tripetala* of the southern pine barrens there are but two other native species to be considered.

The first, *verna*, is also an apogon but its short evergreen leaves are not at all typical and the almost stemless little flower, a melting blue-purple in clear contrast with a vivid orange splotch, hardly seems like an iris. Its habitat is a shaded, well-drained slope from **Ohio** and **Virginia** southward but my clump thrives on sunny gravel. I cannot recommend it for a flat garden, but it is as fascinating as the equally small *cristata* that is found thruout the same district. This is not particular as to soil and the flaccid, light green leaves and small lavender (occasionally white) blooms may form a beautiful edging. The variety *lacustris* is slightly deeper in tone and is found in isolated localities along the Great Lakes.

I think that *cristata* and a hybrid form of *hexagona*, *Dorothea* K. Williamson, are the only ones that I should plant in a small garden. It is fun to bring native plants into the garden but they merit a place as reminders of a pleasant day rather than for their intrinsic value as effective perennials.

Before leaving the subject it is perhaps wise to mention various exotic irises which may have escaped from cultivation in long settled localities. The bearded varieties so rarely set seed that they are more likely to be found in abandoned gardens than in the wild, but the beard-

*Bulletin No. 1. Carl Purdy.

less seed profusely and the seed is often carried along a stream. The commonest is pseudacorus, the European Yellow Flag with bright yellow flowers and bold six foot leaves. The grassy leaved graminea with its fruity fragrance would be an uncommon find but it is only a matter of time before the showy sibirica, orientalis, spuria, and perhaps Japanese varieties become naturalized.

All of these are well-suited to naturalizing, some may not be worth having in a small garden but massed by the hundreds in open meadows or by the water they would be a wondrous sight.

Practical Points

R. S. Sturtevant

Sources of Information. For the amateur the Bulletins of this Society, of which this is the tenth, or current magazine articles are the best sources of information, but the catalogs of specialists contain a great deal of value and interest. "Irises" by W. R. Dykes, "Tall Bearded Irises" by Walter Stager with its wealth of poetical reference and history and "Bulbous Irises" by Sir Michael Foster are small books while those interested in botany will want "The Book of the Iris" by R. Irwin Lynch, "Handbook of the Irideae" by Baker, and "The Genus Iris" by W. R. Dykes this last a large monograph and the latest authority. Unfortunately "Irises" and also "Les Iris dans les Jardins" by M. Correvon are out of print.

Gardens. The Society in cooperation with other organizations maintains Trial Gardens at Cornell University, Brooklyn Botanic Garden, N. Y. Botanical Garden and "Hillcrest" Weston, Mass. There are also large public plantings in Nashville, Richmond, Columbus, Ohio, St. Louis Botanical Garden, Purdue University and elsewhere. As a member of the Society you may visit many private gardens, and naturally commercial plantings are always open to visitors. It is well however not to select always from the appearance of the plant alone. Often nomenclature is confused and your selection may be much assisted by previous reference to the Symposium issued by the Society wherein some 700 varieties are rated on a score of 100 as perfection. This consensus of opinion is a far safer guide than individual recommendations or chance personal selections.

Questions. The Secretary of the Society, in fact, any of its officers and many members are able and willing to answer your questions.

HINTS TO PURCHASERS

Catalogs. There are over fifty special iris catalogs available and the specialist can supply you with worthwhile plants far better than the general nurseryman who cannot afford to carry novelties. Furthermore a good catalog gives every aid in selecting varieties and advice as to their planting and maintenance.

Prices vary from \$.25 a root (or much less in quantity) to \$50.00, or more, for a single rhizome. High prices are based largely on scarcity of stock and do not necessarily reflect the intrinsic merit; many highly rated varieties are inexpensive. It is well to consider cost of delivery and insurance in comparing the prices in different lists. **Stock.** The standard size of root is a 'finger' shaped tuber about the size of a large thumb with one sheaf of leaves. Varieties vary, however, as to size, and furthermore soil and season will affect greatly the appearance of the root you receive. Some soils produce enormous rhizomes and at

certain seasons any thrifty tuber will be lined on each side with green buds. Single roots, or at most two pronged ones, are far more satisfactory than a clump. Absolutely sound healthy roots are, however, the really important thing.

Arrival of plants. In shipping the leaves are cut short and often the fibrous roots are also cut with absolutely no injury to the plant. The roots may arrive bone dry loose in the box, they may be wrapped in paper, in excelsior, or damp moss, but as long as they are firm and in no way softened by over-dampness they may be expected to thrive. Very dry roots may be soaked for two hours before planting but it is not necessary.

Planting. They may remain unplanted safely for a long time if not too moist. Plant on the surface, or even on a mound for drainage the tuber showing and, to promote growth, keep the soil just moist as with too much moisture the plants will rot. Plant in full sun in deeply prepared beds, individual plants 4-12 inches apart, each variety 18-24 inches from the next. For immediate effect plant three roots about six inches apart with the cut ends facing in.

In ordering read the terms and instructions in your catalog carefully and when you order list the varieties and quantities clearly and do not forget your name, address and instructions as to when to ship and how. Such an order will receive more prompt and efficient attention. You will find also that growers appreciate comments on their catalogs and acknowledgements of stock and your expression of appreciation may prove mutually beneficial. In the garden and often from a distance most irises may be transplanted at any season. Preferably the Beardless Irises are shipped in early spring or planted during a wet spell; the bulbous irises may be shipped when the leaves die down, but are not planted until fall; the bearded irises are best planted immediately after blooming except in Arkansas, Oklahoma, Texas, Georgia, and other states when this coincides with the beginning of a long drought. In late fall planting always cover with leaves or straw to prevent heaving by frost.

Location. Sun and good drainage are essential. Few varieties bloom well in the shade and even fewer will endure a water-logged soil. The Bearded varieties like light soil and lime, the beardless appreciate richer, moister soil and do not like lime. The Japanese are the only ones which should be top-dressed with manure.

SELECTION OF VARIETIES

Symposium ratings and personal preference as to colors are the first guides. Catalog descriptions are necessarily brief, color terms indiscriminately used and superlatives frequent and often deceiving. Even the A. I. S. authoritative descriptions often carry a poor idea of the variety. Some catalogs, however, carry frank descriptions, some varieties have a more or less good reputation and a statement of height is usually accurate and often implies many other good qualities. Extreme height that is much over three feet is a comparatively recent development and carries with it quite often size of flower and splendid branching.

Descriptive terms. S. signifies the three inner, upstanding petals called the standards; F. meaning the falls refers to the three drooping or horizontally spreading sepals; the styles are smaller, inner segments that arch over the stamens and often, together with the beard and venations on the haft or base of the falls give a distinctive color effect to the flower.

Size is a purely comparative term that really means little to the be-

ginner but well-branched, tall, and free-flowering are terms which, except in the most carelessly prepared catalog have a real value. They imply more flowers carried on a well-balanced stalk over a longer period of time, all points of great garden value.

Technical color terms as found in a few catalogs and all Official Descriptions are from "Color Standards and Nomenclature" by Robert Ridgway. This permits of the accurate definition of some 1115 colors of which only about 300 are found in irises. Five to seven hues are given between each primary color, seven tones between white and

TO ILLUSTRATE CARRIAGE OF STANDARDS

S. flat



S. overlapping S. arching, cupped



S. conic arched

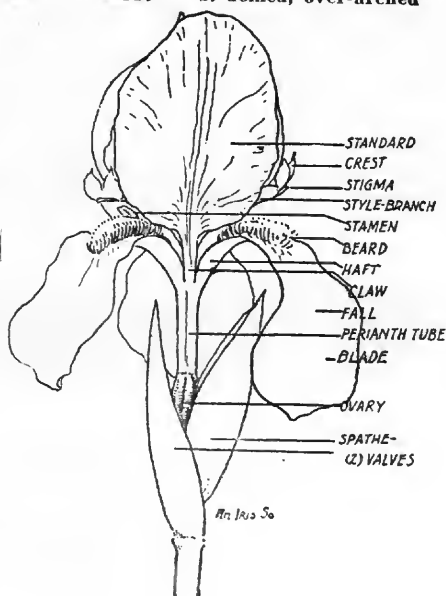
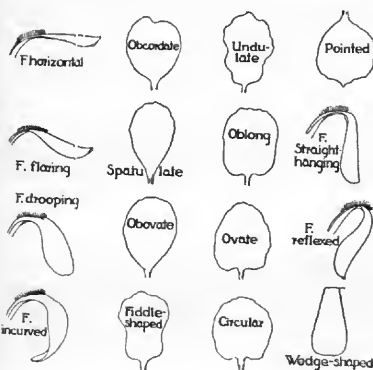


S. cupped, erect

S. tips addressed

S. floppy

S. domed, over-arched



For full explanation of Color and other descriptive terms see Bulletin 6, p.19.

black, and both hues and tones are given also in four gradations between pure color and grayed neutrality. These and also various descriptive terms of habit and flower are fully considered in Bulletin 6.

Balanced selections. It is well to consider succession of bloom and also variety of color. Simple colorings, self or uni-colored varieties make the finest show, deep or velvety colors are always effective but shaded, blended, any mixed coloration is far less popular, and it is wiser to see it before buying. True blue is non-existent, also true red, the iris colors are blue-lavender and deep red-purple. Pink proves to be lilac, mauve or rose, deep pink is red-purple or wine color. Descriptions of color are deceiving but I can help in calling to your attention periods of bloom. The following are arranged in order of bloom as far as possible.

Pumila hybrids, Alpine or Crimean Irises. Dwarfs flowering in late April or early May, 4-15 inches in height; color white, yellow, purple, the yellows apt to be dingy.

Intermediate or Interregna Irises. Mid-May, 10-20 inches in height, larger than the preceding; colors light yellow, white, shaded lavender and purple bicolors.

germanica 18-30 inches tall, much like the preceding and flowering only a bit later; colors white, pearl, red-purple and blue-purple bicolors.

cengialti. 12-36 inches, rather small, only a day or two later to flower; colors mauve, lavender and purple selfs; effective in mass.

Tall Bearded. "German" Irises. 15-50 inches, bloom for three weeks to mid-June or later; color very varied, white, lavender, yellow, purple selfs; purple and white, yellow and purple, bronzed and clouded blends of all three colors. Pallidas are self-colored lavenders; amoenas have white standards and purple falls; neglectas are purple bicolors; plicatas are white margined with a fringe of some purple tint or shade; variegatas are yellow and red; squalens or blends are mingled colors.

Bulbous Irises. Reticulata very early, 4 in. red-purple. Dutch, Spanish, and English bloom in this order about with the tall bearded, onion-like foliage, rather stiff slender flowers that are excellent for cutting; 12-27 inches; none thoroly reliable in the ordinary garden but worth trying as they sometimes become established.

Crested Irises. Tectorum, cristata, and gracilipes, charming, things for the rock garden that bloom with the Bearded irises.

Onocyclus, regelia, Junos, and their hybrids rarely thrive without special care.

Dichotoma is most un-iris-like and interesting solely for its August bloom.

All the above want well-drained soil but the following are water lovers and pseudoacorus and certain natives are semi-aquatic.

Sibirica, orientalis. 15-48 inches. Closely allied forms the latter lower and larger flowered; leaves grassy; colors white, purple veined or purple, rarely pale yellow as in Wilsoni.

Pseudacorus. 6 ft. bold, yellow, will naturalize. These all bloom with the Tall Bearded Irises.

Japanese, Kaempferi, laevigata, 30-48 inches, flowers big and flat in all shades but yellow; require heavy feeding; bloom in late June to early July.

Ochroleuca, spuria and a number of allies. To 4 ft. stiff leaves, rather grassy; colors white, lavender, and yellow shades; appreciate good soil and flower in July, the latest effective irises for the garden.

There are many other species and types that are not so commonly grown but are worth investigating.

GARDEN RECORDS AND LABELS

Labels. Small painted wooden labels written on in pencil last at least a year, large stakes painted white and stenciled in black seem more suited to nursery planting. Zinc cut the desired size, oxidized by exposure to the air and smeared with any thick paint, the name written on in pencil while the paint is still wet, is permanent. Copper wire attaches this to the closed loop (a bored hole has sharp edges which wear the wire) of a heavy galvanized wire. The great drawback to all these stakes is that unless the print is small the names are written the length of the stake and are inconvenient to read. A Canadian firm, however, offers wire stakes, so twisted as to hold the zinc label horizontally. Frames with celluloid covered cards are far from permanent and the heavy embossed English stakes, tho most satisfactory, are expensive.

Records. The beginner often cares little about names and locations but it is usually not long before he wishes to know not only what he has but where it is and perhaps what it looks like. A system of 5 x 3 cards (official Data Cards for irises are available) is capable of any amount of interpolation and expansion whereas lists, note-books, etc., are less easily kept in order from year to year. With the purchase of plant, a card is made out with date, name of firm where obtained, and such other remarks as appeal to our interest, and a notation as to where it is planted. This last necessitates having a rough plan wherein each bed is numbered, then within the bed reference to the points of the compass is generally sufficient to locate the individual planting. E. G. Juniata, Bed 3, SW, locates my clump of Juniata and each year the plan (not drawn to scale) is checked and new plantings located. Or perhaps the relative positions of plants in a row is sufficient. It is advisable to have the simplest possible arrangement of names, or numbers, for the different beds. Do not be troubled by an abbreviation like Asp.I which some fifteen years ago was an asparagus bed and now, in new shape is bedecked with irises.

In crossing it seems easier to write the name of the pod parent first, the pollen parent last as this simplifies the keeping of at least half a record.

In the seed-bed use a co-ordinate system of squares lettered in one direction, numbered in the other and hence any square may be quickly located if stakes are put in about every five squares. It is often necessary to give the year also as many irises do not germinate the first year after planting.

LISTS OF RECOMMENDED VARIETIES

Irises For Varying Soils and Sites

For the average garden. Bearded Iris in variety; most beardless irises, but particularly *sibirica* and *orientalis* Emperor, Snow Queen, and Perry's Blue.

For a rich garden. Add the Japanese, and water before flowering. The spurias also do better in good soil.

Lime lovers. All bearded irises and particularly *reglia* and *onocyclus*.

Lime haters. The Japanese, and other beardless forms to a less extent.

Aquatics. *Pseudacorus* and *versicolor*. In the south the Japanese, *sibirica*, and *hexagona* groups endure wet feet. Almost all iris require good drainage particularly at certain seasons.

For Moist meadows. All beardless varieties.

For shade. *Foetidissima* alone, tho others will grow but will not flower.

For semi-shade. (deciduous). *Cristata*, *verna*, *gracilipes*. Others are not successful for many years and the bearded are not disease resistant.

For the rock garden. *Cristata*, *verna*, *gracilipes*, *pumila*, *reticulata*, *graminea* and many Californian and bulbous species in favored localities.

For naturalizing. *Sibirica*, *pseudacorus*, *versicolor* in meadows; bearded irises to hold the sand of a dune or sunny slope.

Drought resistant. *Regelia* and *oncocyclus* demand a dry resting period, the *Junos* and bulbous irises appreciate it and the bearded irises endure it successfully.

For pot culture. *Japanica* and *Alata* for the green house; *pumila* and intermediate irises for the house proper; the winter blooming *stylosa*, *alata*, *Vartani*, etc., endure cold but the flowers are killed by freezing; the Dutch, Spanish, and to a less extent the English irises are grown under glass for cut-flowers, but in general irises do not force to advantage, that is, their natural time of bloom is advanced but slightly.

In the north avoid *stylosa* and the winter-flowering bulbs, also to a certain extent bearded irises with a strong infusion of *cypriana*, *mesopotamica*, and *Ricardi* blood.

In the south where summer drought prevails do not hesitate to try the lovely *reglio-cyclus* hybrids and the various bulbous species.

These are rather broad suggestions but only a few minor species vary from the mean of their group in their requirements as to habitat.

RECOMMENDED LISTS OF BEARDED VARIETIES

In the following lists average price, rating, and range of color have been carefully considered altho in some cases there are many varieties of about the same value in all three respects and personal predilection enters in.

Early Dwarf. *Schneekuppe*, white; *Statellae*, cream; *coerulea*, pale blue; *Socrates*, red-purple; *chamaeiris* or what is often listed as *pumila*, purple, or yellow.

Intermediate and germanica. *Florentina*, pearl; *Golden Fleece*, yellow; *Ingeborg*, white; *Dorothea*, lavender; *Kochii*, red-purple; *Mrs. Alan Gray*, mauve; *Bluet*, blue; *Brionense*, lavender.

TALL BEARDED

Cost not over \$1.00. *Aurea*, *Flavescens*, *Sherwin Wright*, yellow; *Mrs. H. Darwin*, *Innocenza*, white; *Pocahontas*, *Ma Mie*, *Fairy*, *Mme. Chereau*, *plicata*; *Lorelei*, *Fro*, *Iris King*, *variegata*; *Dalmatica*, *Caterina*, *Juniata*, *Albert Victor*, lavender selfs; *Queen of May*, *Lohengrin*, *Quaker Lady*, *Her Majesty*, *Wyomissing*, mauve and rose; *Archeveque*, *Caprice*, red-purple; *Nine Wells*, *Perfection*, *Monsignor*, purple bicolors; *Alcazar*, *Jacquiesiana*, *Dr. Bernice* bronzed; *Afterglow*, *Mary Garden*, *Eldorado*, odd tones; *Rhein Nixe*, *Victorine*, purple and white.

Cost \$2.00 and under. Add *Shekinah*, yellow; *Nancy Orne*, B. Y. *Morrison*, purple bicolor; *Anna Farr*, *plicata*; *Kathryn Fryer*, *variegata*; *Isoline*, rose; *Seminole*, red-purple.

The Best as rated regardless of cost. *Dalmatica* *Princess Beatrice*, *Lord of June*, *Queen Caterina*, *Alcazar*, *Ambassadeur*, *Souvenir de Mme. Gaudichau*, *Lent A. Williamson*, *Georgia*, *Shekinah*, *Reverie*, *Crusader*, *Seminole*, *Leverrier*, *Dominion*, *J. B. Dumas*, *Sweet Lavender*, *W. J. Fryer*, each in their color.

Unrated Novelties (a personal selection) *Morning Splendour*, *Nimbus*, *Delight*, *Argentina* (white), *Valkyrie*, *Citronella*, *Swazi*, *Bruno*, *Balboa*, *Jubilee*, *Cardinal*, *Moa*, *Azrael*, *Aphrodite*, *Wild Rose*, *Gold Imperial* are but a few of many that are worth watching. I naturally do not know all the new things.

MAINTENANCE

Spring. Top-dress with bone meal, and lime (except for the Beardless), or wood ashes (all rich in potash) annually using about a table-spoonful to the square yard or even more. The beardless and regliocyclus varieties appreciate well-rotted manure, but only the Japanese will endure fresh manure.

Summer. Remove old flower stalks and dying leaves; the stalks break off easily at the base and the leaves pull easily leaving no bruised edges for the entrance of bacteria. Keep the center of the clump open to the sun as the rhizomes need a thorough baking. Weeding of course is a common garden requirement.

Winter. Clean the clumps in preparation for spring growth, the beardless may be lightly burnt over, and cover sufficiently to prevent heaving by frost. If water does not stand on the rhizomes most irises are perfectly hardy, but in a heavy soil the frost may heave them out of the ground.

There are few diseases to be considered but clean, hygienic conditions thruout the year are a preventative. Any diseased roots or leaves should be burnt.

PROPAGATION

Normal increase. A healthy garden clump may remain undisturbed for five to ten years before refusing to flower. Usually 50% or more of the newly planted rhizomes will bloom the following spring and also send out two or more new leaf sheaves. These form new rhizomes and flower buds during late summer and fall in preparation for the following spring. With ordinary good growth both roots and flower stalks at least double in number each year and at any time new plants may be secured by breaking off and planting a piece of rhizome with a growing bud attached.

Forced increase. With a valuable variety it often pays to force growth in order to get many new buds, each of which, no matter how small the attached roots, or piece of rhizome may be, may be grown to saleable size within a year. In fact a rhizome may be cut into half-inch chunks showing no growth, the chunks kept in moist sand in a frame until adventitious buds develop. This may be done with fair success at any season of active growth, but not while the plant is in bloom. The flowering sheaf or growing tip does not send out new buds and apparently a one or two year section of the rhizome is more prolific than an older one which becomes dry and almost lifeless. The production of flower stalks and especially of seed-pods greatly retards new growth.

Increase by seed. This is the only way of securing a new variety. Beardless irises seed freely and show little variation in color from the parent except in the case of the Japanese varieties which are themselves hybrids. Hand pollination is often required in dealing with Bearded Irises which produce an endless variety of shades; it is not difficult but I shall refer you to the special article on hybridization. Both types bloom the second or third year from seed, but the bulbous irises and particularly the oncocyclus germinate less readily and usually flower only after four to seven years. Seedlings are an inexpensive and interesting way of increasing the variety of garden color.

The seed-pod begins to yellow about six weeks after the flower passes and it tends to open and scatter the seed. To obviate this loss we gather the pods, open them, spread their contents out to dry. They are planted in October in a shaded place in the open, many germinate the following spring and are quickly transplanted to permanent beds to remain until they have bloomed.



Newly Planted Seedlings in Miss Sturtevant's Garden
Note the white string used as a marker

DISEASES AND ENEMIES

Fortunately the number of diseases is small, in many gardens almost unknown, and a thrifty plant grown in well-drained soil is rarely attacked.

Macronoctua onusta, the iris borer must like others be hunted by hand. A small brown night-flying moth lays its eggs in the leaves just before flowering time, or later, in early August. The larva hatches and, as he eats his way down to the root, leaves a translucent slimy trail. At this stage he is easily seen and pinched but later in the root he may not be discovered until the clustered leaves fall apart and we discover that the entire body of the rhizome has been eaten away and the inch and a half pinkish-white caterpillar with a brown head has gone on into the soil to spend the winter. The observing gardener finds nothing terrifying in such an attack but suddenly to discover a nest of these creatures is rather startling and quite destructive of the entire clump.

Bacillus omnivorus and some of his relatives is a well-named all-destructive soft rot with a most unpleasant smell. It is frequently found in cabbages, or root crops, and old vegetable gardens are not always a desirable site for an iris garden. A healthy rhizome exposed to the sun is pretty resistant, but if it is softened by too much moisture or weakened by over feeding it quickly succumbs. A bruised spot or the jointure of leaves and root may become infected and the rot rapidly spreads, completely destroying the tissue as it goes. Wet seasons are particularly conducive and often the first sign is a suddenly fallen flower stalk. On examination we find the stem and much of the rhizome a soft mush. This must be thoroly cut and cleaned, the diseased parts burnt and the plant either taken up, or the earth cleared away so that it may be well disinfected. Some use permanganate of potash in a solution of 2 to 1000, others corrosive sublimate 1 to 1000 and both are



Iris Dorothea, an Intermediate, with Beriloz, a pumila hybrid, Tulip, Rosalind, and Phlox divaricata. The flower tends to become flat.

effective, but I find that a long exposure to full sun-light will often do the trick. It is well to remember that the rot is very infectious, refuse should be burnt and utensils sterilized, and also that it thrives in lime. Acidity may induce leaf spot but it reduces rot.

In long continued wet weather, the old lifeless part of a rhizome often becomes soft and rotten, the base of the flower stalk also leaves a scar on the rhizome and in both cases we may have the appearance of a soft rot, but not its odor. Such natural sogginess may often give entrance to destructive bacteria but in itself, it is harmless.

Leaf Spot whether caused by *Heterosporium gracile* or by *Puccinia iridis* is rare in this country probably because of our hot summer suns. If at all prevalent the remedy is to spray every three days with a fungicide like lime-sulphur. I know of but one case where it has proved at all destructive.

Naturally iris are attacked by insects common to other garden plants, cut worms that we feed with paris green, leaf-eating insects that may be "got" with an arsenic spray, etc., but on the whole they are markedly free from enemies.

ABNORMAL DEVELOPMENT

Time of Flowering. Although in California and elsewhere many hybrid irises may show scattered bloom for months, in most gardens there is but one period of bloom in the year. Certain varieties, however, occasionally bloom for a second time in the fall, *Crimson King*, *Mrs. Alan Gray*, *John Foster*, *Allies*, and many *pumila* hybrids among them. It is not unusual for plants in active growth to mature their buds and flower in an unreasonably warm fall. Whether in breeding this character may become fixed is still a matter for experiment but success is possible.

Peloric flowers, and other abnormalities, one, two, four or even six segments in place of the regulation three are not infrequent, occasionally two or more such flowers may appear on the same stalk but no case has been reported of such a character appearing repeatedly. It seems due to purely temporary environmental conditions, not to germ plasm. The so-called doubling of the Japanese Irises is the result, not of actual increase in number of parts, but of a more or less large petaloid development of the styles, stigmas, or both which increases the apparent complexity of the flower. Analogous development occurs in other irises when the beard is transformed into a crest or ridge, when two flowers are closely superimposed or juxtaposed, and when the standards are held horizontally and develop the beards (very rare) and haft markings of the falls. This last occurs commonly in the varieties *Clematis*, *Rosette*, and *Japanesque* and *Dorothea*, *Eduard Michel*, and others tend to this formation, often it is more a matter of poor substance rather than actual intention.

Leaves and stalks also may be fused, ramified, or creased by some injury to the growing bud. Occasionally the green spathes are enlarged and colored.

Color, quite different from the normal may occur in a single flower or in splotches and splashes at random. Frequently the pearl *Florentina* throws purple or purple splashed flowers; *Victorine*, *Lemon*, *Arlequin Malinais*, *Lorelei* usually show some splashes of the purple of the falls on the standards, a distinctive but not altogether attractive trait. I have seen flowers clearly halved in purple and white, odd splashes of either color but never an abnormal localization of yellow. The why and wherefore of these irregularities is not known and they are rarely permanent from one year to the next. In most cases they arise from nutritive causes though some consider they are signs of a stock weakened by long cultivation and repeated inbreeding.

Use in Ornamental Plantings

(A very free translation)

M. Philibert Lavenir

The Iris family by its seductive grace and its diversity of color is one of the most remarkable in the realm of plants. With the exception of an orchid there is, perhaps no plant with such curiously formed flowers but while most orchids demand hot house treatment the iris are usually hardy and often thrive in the least favored of situations. The iris is above all the plant for the garden, the ideal plant which flourishes with a minimum of care, the plant of splendid effects, able with its bright colors to furnish the designer, or gardener, a decorative element of the highest rank.

Whether for vigorous growth and height, or for delicacy, but always for its wealth of attractive flowers at very many seasons, the iris lends itself equally well to intimate use, or to grand compositions. Whether in the simple garden border, or in large masses in the open park, one appreciates the iris for the color which has done so much towards making it a popular flower. Moreover is not the name itself an inspiration suggesting the tints of the rain-bow which Iris, as the messenger of Juno, left in her flight. This figure of mythology, gleaming with light could do no less than become the god-mother of a flower so favored with color.

We will consider the role that the iris plays in the garden, and especially what it might do for their adornment.

We may have gardens given up to irises or we may enter domains of most varied conception. The diversity of sites, the appearance and the extent of the areas to be planted permit us to use irises as the painter uses the colors on his palette. Whether on slopes, among rocks, along a walk, on the edges of a lake, or stream, in an old wall, or thatched roof, or in great sheets of color as the English use narcissi we find among the many species of iris some to suit every need.

Talus et Rocailles. It is above all in the decoration of a dry slope that the iris is of value. Even when left to themselves they often bloom abundantly. We know of a railroad embankment near Lyons which, in May, is literally covered with purple iris.

All the garden irises accommodate themselves to disadvantageous sites. If the slope is exposed to the full sun one can try with good chances of success the graceful little *I. stylosa** with its clear lilac flowers in mid-winter and its even green carpet of foliage. It is to be noted that *stylosa* requires a complete rest in a hot, dry summer. If on the contrary, the slope is shaded, an unfavorable location for most irises, we must choose *I. foetidissima*, one of the few which thrives without sun. The flowers are not very ornamental, but the plant is effective in autumn and winter when the opened seed-pods reveal the coral red seeds. There is also a variety with white variegated leaves which gives an effective contrast. The name *foetidissima* should be no obstacle to its planting for there is odor only from the crushed leaves.

We can also use irises on rocks which it would be difficult to adorn in any other way. Even in crevices with little soil they will do better than most plants. In the vicinity of Vienna there is a rocky escarpment that, each spring, is brightened with mauve or purple.

Among less large rocks, in the alpine garden where plants are to be seen near at hand and where, at the same time, they can be given spe-

**Lungicularis (stylosa)*, a winter flowering species, is not hardy in the north but is strongly recommended for California. There are a number of varieties, white to purple.—Ed.

cial care it will be of interest to try small bulbous irises many of which bloom in winter or early spring. Among these are *I. Vartani* with fragrant blue-lavender flowers, *histrio* clear blue, *histrio alba*, *histroides* deep blue, *Bakeriana* blue-violet and the charming *alata* of which the color varies from lavender to white and which resembles an orchid; this last suffers in our winters and is recommended only for the south. (This applies unfortunately to all these varieties in the United States. Ed.) In general all the bulbous irises are a little delicate and it is only in sheltered sunny places and in well-drained soil that one can hope to succeed.

We recommend for the rockery also, *I. stylosa*, of which we have already spoken. It is much hardier and is rhizomatous. Planted in groups with March flowering narcissus, snow-drops and scillas it is most gracious in effect.

Bords des Eaux et des Allées. In gardens one frequently meets plantations of irises not adapted to wet soil on the banks of ponds. Bearded irises in variety are often planted near water; this does not signify that the ground is necessarily marshy for often the water is in an artificial basin but one concludes that both amateur and professional gardeners have come to consider iris particularly adapted to this use. Water brings life into the garden, movement and a feeling of gaité and it is natural to enhance this feeling by the use of plants with bright colored flowers.

Some species are particularly adapted to wet locations. *Iris pseud-acorus*, the common Water Flag, is one of the prettiest of our indigenous plants with its beautiful yellow flowers carried on tall, strong stalks. It can be treated as a true aquatic, at least in shallow water. *Iris siberica* in blue, or white, *acoroides* sulphur yellow, *fulva* reddish brown, *Monneiri*, *aurea* with its golden corolla, *ochroleuca* yellow and white, *spuria* clear blue, all accommodate themselves very well to wet or marshy ground. These last four are vigorous plants reaching over four feet in height. We have long cultivated the beautiful variety of *spuria* known as *Notha* which cannot be recommended too highly.

Finally there are the iris which astonish us by the grandeur of their flowers and the freshness of their color and which bring to European gardens the splendour of placid lakes and the strange character of Japanese art. We mean *Iris Kaempferi* or *laevigata*. Unusual size, delicacy of shade, elegance of form such are the qualities which make these the most beautiful of all irises. *Iris Kaempferi* has been cultivated widely in Japan for a long time and the horticultural publications have often reproduced pictures of great fields of many colored irises which, in flowering time, should reveal to the eye a ravishment without parallel. This iris likes wet, flooded ground, but it would be a mistake to think that it must be planted in water. We have seen magnificent blooms in the open gardens at Verrieres, but they are especially suited to planting near water.

It is not without interest to report a very ingenious method that the Japanese use in cultivating these swamp-loving plants. We owe knowledge thereof to our friend M. Correvois who describes it in one of his books. The iris are planted in wooden boxes filled with earth and these are dispersed, like rafts, on the surface of the water, and in this soil that is constantly wet the plants prosper admirably. It is a most ingenious idea and worthy of emulation. The appearance of these islands of *Iris* mirroring their colors in the crystal waters reminds one of the "vaisseaux de fleurs" built by the nymphs of which Chateaubriand speaks and on which herons and flamingos embark, passengers to the land of Atlantis.



Japanese Irises in the Long Island Garden of S. S. Cummings.

The same principles governing the planting along streams hold good in planting along a walk. Groups here and there enhance the interest of a walk and almost all the hardy kinds are suitable to use. *Iris germanica* in variety, *pumila*, variegated *pallida*, *florentina*, Spanish and English, etc. It is well to choose places with a limited view and a heavy background of green against which the flowers show to advantage. For the same reason specimen shrubs form backgrounds, we may even plant the iris among dwarf shrubs with as good an effect as of lilies among azaleas or small rhododendrons.

Vieux murs et vieux toits de chaume. *Iris*, wrote Alphonse Karr "on the ridge of little thatched roofs give to them a splendor that artifice could only approach, and richness that is lacking in the palace of a king, or even of a profiteer". Nothing is more charming indeed than these tufts of iris attached to the half-rotten old roofs of straw which seem to provide sufficient nourishment.

What we have said about plantings in crevices can be repeated as applied to planting in walls and ruins. Anywhere that we can stuff in a little earth into a crack there can we get an iris to live. The idea of planted walls built without cement is but little known in France and yet how many rock and desert plants will respond to this picturesque treatment. Drought-loving irises are among them and an old wall aflour with *Iris germanica*, *pumila*, *florentina*, or *tectorum* would tempt the brush of an artist. And what seductive tableaux might be composed of irises and other rock plants all blooming at the same time: *Alyssum saxatile* golden yellow, *Aubrietia* mauves, *Saponaria ocyroides* rose, with starry flowers, *Saxifrage*s with feathery panicles, etc. These examples are frequent in gardens in England where they even grow plants in the crevices of stone or brick pavements and on steps.

When one builds a wall of this sort each layer of stone should be set in a bed of earth. The resources of the gardener are infinitely varied and it is his duty to utilize them in every possible way and to

put his experience and ingenuity to the creating of beauty even in sites that at first sight seem least favorable.

Color effects in extended plantations. This question is near to that of wild gardening which is so eloquently expressed by William Robinson in his "The Wild Garden". In that it is said that irises by themselves can make a whole "jardin sauvage". Nothing is more true and what a wonderful garden we might have with plantings on a scale that we find in their native habitats! What a radiant picture, what a symphony of colors, these plants, arranged with art, might produce!

Some years ago at Gavarnie in the Pyrenees towards the end of July the meadows of emerald green thru which ran the Gave de Pau were brilliant with English Irises as blue as the sky of Aragon. So numerous were they that for long hours we botanists circulated through them as one passes in the Alps days among gentians.

Could not we create in our park-like meadows similar scenes with this same species or some of its many horticultural varieties? Could we not with this or other species realize fields of flowers as wonderful as are the Daffodils in the English parks? It was not until we saw the graceful trumpets of *Narcissus* at Warley on a warm April day that we understood what "wild gardening" was.

We must acknowledge immediately that our neighbors across the channel have used iris in this fashion, one need only look over the garden journals to find lovely pictures of iris gardens planted in the natural style like that at Clandon Park. Let us cite that of M. Wilson at Wisley mentioned by M. Correvon in his book on the iris, where, in a single year 30,000 Japanese irises were planted on the shores of a little lake. That is an example of planting in mass. To plant a large part of a park is to create a veritable iris garden, but a garden instead of being planned along geometrical lines may become a reproduction, in miniature of those "Deserts d'Iris" that Pierre Loti became enthusiastic about in one of his travels in Morocco.

It is very probable that in certain distant parts of a large estate where the grass was not mown one could naturalize a certain number of irises. But to obtain real success one should clear a bit of ground and plant it entirely to irises grouped in their varieties. They might then be cared for as in a border and when in bloom the whole countryside would be transformed; a ravishing polychrome tapis would delight the eyes and the greater its extent the greater its beauty.

It is the rule in all plantations destined for beauty of mass. Plant one kind in great quantity. Take for example the fields of gentians, snowdrops in the mountain brush, or more simply consider the fields of weeds in our waste lands and compare them with the innocuous effect of isolated tufts of the same plants in our gardens.

You may say that large plantings mean a large expense but when one uses a hardy plant as undemanding of good soil as the iris it would seem that the result was worthwhile.

Les Iris dans les Plates-bands de plantes vivaces. For some years hardy plants have become more popular. English examples richly illustrated in French publications have found admirers and happily imitators also. By selecting species with care and grouping them in large borders of either regular or informal form one can secure very brilliant floral effects. The high price of bedding plants (called "a massifs") which must be renewed each year has also brought amateurs to an interest in hardy plants.

In such plantings the iris plays an extremely important role. All the hardy varieties find a place: *pumila* at the edge with other dwarfs; *germanica*, *xiphium*, *flavescens*, *sibirica*, *florentina* in the middle; *ochroleuca*, *mona*, *spuria*, *aurea* behind. The gardener is embarrassed by



Irises on a slope in the Garden of Sydney B. Mitchell, Calif.

the wealth of variety offered to select from. The border flowers are generally seen from near at hand and it is there that we should place the most beautiful, those that are most perfect in form and color. Among the novelties we cannot too highly commend those of *macrantha* parentage originated by the Maison Vilmorin; *Opera*, *Oriflamme*, *Alcazar*, *Ambassadeur*, *Ballerine*, *Cluny*, *Dejazet*, *Magnifica*, *Diane*, *Archeveque*, *Eldorado*, etc. which have been much admired both at Verrieres and at the spring exhibition at Paris. It is only necessary to consult the catalog of a specialist in hardy plants to find superb varieties relatively new, and far surpassing the varieties of former times.

Les Iris cultives pour la fleur a couper. The iris, this flower of artists, would be a treasure to florists if the stalks of all varieties were equally fine when cut. Unfortunately one can reproach the Bearded for its short duration as a cut-flower, the blooms already open are fragile and the buds do not open well.

There are, however, others that are better in this respect. The marvellous *Kaempferi*, *ochroleuca*, *Monneiri*, *aurea*, *Notha*, *Monspur*,

always very recherchés, then sibirica and especially the pretty varieties of the Spanish and English, are easily kept in water for a week. Each year, in mid-March the stores are filled with *I. Susiana* with its curiously veined brown flowers and with the Dutch iris *Imperator* with yellow and blue flowers born on long straight stems.

In a general way we recommend that all irises be cut just as the flower opens. Then they are less fragile and may be packed and shipped and will open when put in water.

Ornamentation des serres froides. At the Kew Botanical Garden there is a cool house that visitors never fail to see in winter or early spring; it is the alpine house. Not wishing to depart from our subject we will say little as to its advantages but it was there that we first saw *I. Bakeriana*, *stenophylla*, *Danfordiae*, *reticulata*, and *scorpioides* whose large flowers of blue or yellow or violet were close neighbors to pots of saxifrage and other rock plants.

In the "Conservatory" it was not unusual to find irises in with other tropic plants, the clear blue of *I. japonica* with the rose of begonia *Gloire de Lorraine* and *I. stenophylla* lilac and yellow gleamed among the *Epacris*, hyacinths and Chinese primulas.

Many other iris might be grown in pots and used not only in a green house but in appartements, particularly the small bulbous species, as they dislike the winter damp and it would be very simple to keep the pots dry when desirable. For this same reason pots or flats should be well-drained. The precocious flowering of these is something the gardener can take advantage of by growing them in a frame. Species like *alata* and *persica* may be mingled in pots with divers small bulbs, *crocus*, *scilla*, single hyacinths, and *Duc van Thol* tulips.

The *Oncocyclus* irises which are often killed by the winter find themselves at home in pots and with their greater height and larger blooms they will prove of great value in the greenhouse. *I. stylosa* which about Lyons is so early that cold and ice injure it, may be flowered as freely under glass as in the south of France where the azure of their flowers is one of joys of the garden. *Reticulata* and the Dutch, Spanish, and English irises all thrive under these conditions.

The flowering of these early irises is advanced, they are not forced very much perhaps, but they do bloom slightly in advance of their normal season.

We have passed in review the many uses to which irises may be put in the garden. This task has proved all the more agreeable in that it brings to mind many charming days passed among them in the past. One leaflet of our notebook recalls the beautiful flowers of the Cambridge Botanic Garden, another the rich collections of Miss Willmott at Wisley. All these impressions already distant bring back with pristine freshness the time when, as a young gardener they were the delight of our leisure hours. May our readers find in the culture of these flowers as deep a delight as that which we have experienced in their study.

Varying Characteristics

Our superficial interest is solely in color effect, but differences in habit of root growth and branching, and variations in carriage and shapes of flowers influence greatly the what, where, and why, of the selections we may make. Ecology is the study of the plant and its relations in relation to its environment; our garden beds may all be prepared according to the same rule but other environmental conditions vary greatly, and, even more to be considered is the fact that the response of various species to these conditions is also variable. Our gar-

den varieties are most adaptable, while many species are difficult to grow purely because, through a selective process, they have become accustomed to a certain sort of environment and cannot change their habits. Our success in their culture depends upon how well we understand and provide for these inherent characteristics, and our success in artistic effect results from a consideration of the more superficial yet still different qualities produced by years of breeding and cultivation.

Roots. Whether bulbous, or rhizomatous, all the main iris roots are storage roots and therefore adapted to a resting period of comparative drought. As natives even the water loving beardless varieties endure periods of summer dryness. It is interesting to note also that species with a fine fibrous covering to the bulb, or rhizome, are relatively more resistant to extremes of moisture whereas the extremely smooth bulbs of the Spanish iris, the smooth fleshy roots of a Juno, and the smoother rhizomes of the oncocylus demand the best of drainage and often a complete absence of moisture in summer. The bulbs are primarily storage reservoirs fed by new roots which completely die away as the leaves yellow. In the bearded irises with their big rhizomes new feeding roots are also sent out each year, but after flowering you will usually find both old, rather fleshy roots and new sprouts, coexistent. This is the case under garden conditions rather than in nature, but such continuous growth is not desirable for many species like Korolkowi, or even the true *pumila*. In the Beardless irises many of which form dense tufts to get the rhizomes above the water-logged soil I think that you will find the fine often wiry feeding roots enduring from year to year. It should be understood that nourishment is taken not by these easily seen fine roots, they but reach out for the supply, but by almost microscopic root hairs that are constantly being formed at the growing tips.

Under cultivation these characteristics influence methods of culture. To obtain good growth we must fertilize as new growth starts as all irises form their flowering buds the previous year from the surplus of nourishment over and above that needed for mere existence. To obtain a needed rest for the plants we often must dig and replant each year the bulbs of some species and the small rhizomes of the oncocylus and other species that practically lose their foliage after flowering, while the beardless varieties with persistent, almost evergreen foliage, to become well established take two or three years.

Much sun is required to ripen the deeply planted bulbs, considerable is a necessity for the surface rhizomes of the bearded species, but mere dryness, not direct sunlight is sufficient to mature the tightly matted rhizomes of a Siberian which has pushed itself well above the surface for this reason. We consider these points in associating irises with other perennials.

Density of root growth affects our arrangements for effect. With bulbs we can plan for an overplanting of forget-me-nots or shallow rooting annuals, with bearded irises we plant deep rooting perennials with not too heavy a foliage growth to overshadow the iris rhizomes; and with beardless varieties,—well we must try for "ironclad" perennials that can either hold their own by their compactness or by their ability to run in and about the tufted irises. It is impossible to grow anything permanently in the same area with an established clump of iris, we can merely decorate it later in the season with over-arching sprays or tendrils. This, of course does not apply to new plantings which themselves may be smothered by interplanting and over-shading.

Foliage. Except in a state of high cultivation no iris is of all season value for its foliage, but a thrifty plant of a bearded iris may be kept in fine condition thruout the summer, and the beardless are a



1. A punilla hybrid with a one-flowered head; 6-15 in.
2. A two-flowered stalk typical of an *Oncopogon*.
3. *Aphylla*, an early flowering species, branched to the ground and with conspicuous spathes; to 15 in.
4. *Germanica* with a few short branches above the center; to 30 in.

5. *Variegata*, short but low-branched; 12 to 30 in. at most.
6. *Rakan, pallida x variegata*, more widely branched; often over 30 in.
7. *Lohengrin*, a typical *pallida* with high, short branches; (close branched) 2 to 4 ft.

8. *Queen Caterina, cypriana Caterina x pallida*; stalk slightly flexuous, high but well-branched.

9. *Mandelay*, a *cypriana Caterina* seedling with fastigiate branching, an extreme example of what we find in *cypriana*, or *mesopotamica*, and their hybrids.

10. *E. H. Jenkins*; many long branches, the lower branches even are again branched, a good example of a well and widely branched variety probably of *Trojana* blood.

11. *Stanley H. White*, curious branching due to a cross of *cypriana x variegata Hector*. Theoretically this type of branching is ideal for mass effect.

Numbers 6, 9, 10, and 11 show some of the developments of modern hybridization. *Stanley H. White* (11) has an almost unique habit of bringing the flowers up to an almost even plane, but other seedlings of similar parentage have not shown this characteristic. *E. H. Jenkins* (10) on the other hand is only an exceptionally fine development which is paralleled by many of the recent introductions. *Rakan* (6) and *Queen Caterina* (8) show merely average development for their types, such branching as may be found in almost 90% of our garden Irises.

Although *M. Millet* and others have paid much attention to free-flowering, the varieties introduced by *A. J. Bliss* are particularly noteworthy for their splendid branching,—again and again we find his varieties of *pallida*, or *plicata*, well and widely branched, very different from the close branching of the typical *pallida* (*Lohengrin*, 7).



Drawings by
Grace Sturtevant

good green though as the months pass they lose their bold erectness. The off season is immediately after flowering as many varieties make a fall growth which even in Massachusetts is practically evergreen throughout the winter. In color we have the deep green typical of the Japanese varieties, the light yellow green of *cristata* and some *Fleur-de-lis*, and the extremely glaucous gray green of a *pallida* with an occasional white or yellow variegated form that is rarely of vigorous growth.

In form there are the awl-like spikes of *reticulata*, the narrow grass blades of *sibirica* and *gracilipes*, the broader bands of *Pseudacorus*, the small sickles of an *onocyclos*, and the many fans of the bearded varieties their outer leaves sometimes three inches across. The straight lines of the foliage prove most effective in contrast with the usual rounded leaf-forms of other perennials.

Stalks and Branching. These, in their variety, are best studied in picture and drawing, but certain pictorial results deserve mention in passing. Though the sketches are all of Bearded Irises the types of branching in other groups are comparable. Naturally one does not expect a long period of bloom from a few-flowered stalk. Many stalks of this type however, give splendid color. The single flowered *pumilus* when they do well are solid in flower, even *variegata* with its head of blooms makes an even plane, but with the more branching varieties there is color not only at the top, but below often to the green of the

leaves. *Pallida* is high and close branched, in mass there is a band of color held high on slender stalks; in *aphylla* or *trojana* we get almost a spray of blossoms and a single stalk seems complete in itself. In breeding we get not only intermediate developments, but new combinations, witness the long fastigate growth of *Mandalay*, the curiously wide angled branches of *Stanley H. White* which bring the flower on the branch almost to a level of the terminal or the wonderfully ramified candelabre of *E. H. Jenkins*. Long branches and many of them are recent developments almost without exception and when we add well-poised lovely blooms there is real achievement. Amount of branching, however, is like height largely dependent upon good tilth. Stalks may be erect, slightly angular as in *E. H. Jenkins*, or, unfortunately, flexuous and so over-burdened with large flowers as to writhe upon the ground unless staked. Much of our effort has gone towards developing size of bloom and freedom of branching all points of value in a specimen and I question whether the mass affect of an established clump should not be more considered. There, too, it is possible to get grace and balance in addition to color.

Flower The parts of the flower and the different positions of the falls and standards are well diagramed, its morphology is beyond our scope and appreciation of certain types is largely a matter of personal taste. This is likewise the case with color which is constantly written of from many points of view and yet presents still other possibilities as the iris shows a far wider range of tones and shades, tints and hues than almost any other perennial.

Growth. Even among the commonly grown garden irises there is great variation in vigor, particularly among some of the novelties and unfortunately there are so many controlling factors that we can make only general recommendations as to culture and must leave the individual to learn from experience in his own garden just what varieties will thrive in his soil and climate. Few irises will endure standing water, few also are killed by real cold, but many are injured by unseasonable frosts or by combinations of cold and moisture.

Thus we find variations between not only species and varieties but variations within the variety in its response to soil and sun, water or cold and as our garden interest grows so does our absorption in the study of variations of every sort.

Hybridization

R. S. Sturtevant

There are laws of heredity and there are many theories built up to fit the facts in the case and yet so complex is the constitution of a single individual that rarely can any definite group of characters be foretold. Particularly is this so in irises which, as perennials, do not lend themselves to a study of hundreds of individuals and even more because our interest is horticultural rather than scientific. Some study of the subject is, however, worthwhile if only for its increased interest. There is much satisfaction in creating, but there is an added satisfaction in the achievement of a carefully planned object.

The first law of heredity was formulated by an Austrian monk, Johann Gregor Mendel, in 1865. Through experiments he proved that, given two unit characters a cross produced in the first generation a series of similar individuals showing one of these factors, what he termed the dominant factor and that in the 2nd generation 75% of the progeny showed this dominant character and 25% the other factor which he called a recessive. For example in crossing tall and dwarf

peas, F1 was tall and F2 was 75% tall and 25% dwarf; hence tallness was dominant and dwarfness a recessive. Carrying these into the next and succeeding generations he found that one third of the tall peas produced tall bushes while the other two thirds produced tall and dwarf forms at a ratio of 3:1 as in F1. These last two thirds revealed their hybrid origin but it is worthy of notice that this condition was not apparent in the individual by any means, but could only be proved through its progeny.

This is one of the difficulties in irises, in all the garden varieties we are dealing with hybrids, and at that, they are hybrids not as concerns only two characters, a dominant and a recessive, but with an unknown number of factors. By chance we may secure a batch of seedlings which fit this simple law, but the chances are very small because our interest lies quite largely in color and it is still an open question as to whether the different colors in iris are unit characters or the results of chemical reactions.

Later geneticists found that, though Mendel's law worked in a good many cases, there were many where it was insufficient to explain the results of extended experiments. Of the many theories that of a "partial blending" *seems to me most applicable to Iris.

Now an allelomorph is merely one of a pair of unit characters which never appear together; one is dominant and the other recessive, as tall and dwarf. In "partial blending" two allelomorphs segregate, but with modification due to varying degrees of blending between the two. There are other explanations of this phenomenon but this one appeals to my limited understanding of genetics.

There are also cases of "linkage" where two characters seem to be inherited as one.

Let us go back to Mendel's law. It deals with unit characters, i. e. characters which are transmitted without change in certain definite proportions from one generation to another. Although numbers do not permit of scientific proof there do seem to be a number of unit characters in the bearded irises.

Venation of the blade of the falls is dominant over a self-color; e. g. a cross of pallida x variegata produces flowers with veined falls.

Bicolor is dominant over selfing; e. g. pallida x germanica gives bi-colors. Unfortunately bi-colors may be of hybrid origin and amoena x pallida may give 25% of selfs.

Selfing is a recessive. This is a mere corollary from the above.

Plicata is a recessive factor; very, very rarely do we find two plicatas which produce any plicatas in the first generation. As a matter of fact a red-toned or deep-hued pallida self is much more apt to produce some plicatas.

These three represent localization of color, not the actual colors. This means that if we cross any self colored iris with a veined or solid bicolor, there will be no selfs, in appearance at least in F1, but selfs will again appear in F2 in the proportion of 1:3 (bicolors). This perhaps explains our difficulty in getting yellow selfs, as commonly yellow is linked with variegata venation.

Velvet is a recessive character. This is a doubtful statement, but it is a difficult quality to secure consequently probably a recessive. The fact that Jacquesiana seems to produce self-colored progeny also indicates that this velvety quality of the fall is not necessarily due to venation.

Before we draw any deductions from these tendencies let us consider color in connection therewith. Color may be chemical, or a case of

*"Genetics in relation to Agricultural," p. 189.

"partial blending", but it does present a more or less complete "linkage" with the above unit factors. Chemically color is due to anthocyanin (which is probably derived from a flavone) either solid or in solution* and plastid or soluble yellow. This would mean but little if we did not find that the apparent colors did not appear to react always in the same combinations. For example yellow is common on the standards and at least the outer rim of the falls both in *variegata* and in various hybrids; in dilution it is a self in *pumilus*; but it has not been found as a venation, nor as a *plicata* marking except among the most recent of hybrids. Perhaps the yellowed reticulation of the haft may be explained "as albinism due to the loss of the power to produce the purple anthocyanin pigments." It is quite possible that we have in irises a series similar to those found by Miss Wheldale in *antirrhinum*s; an anthocyanin-soluble yellow series, magenta, crimson or rose, ivory white, and yellow; and a yellow plastid series, crimson, purple, ruby, yellow cream, and white.

Roughly speaking we have purple; yellow; and the recessives *plicata*, white, red, and bluish in diminishing proportions as to numbers of varieties in each class; also there are more light varieties than dark ones. Apparently the relative dominance of these color factors is arranged in the same order. We cross purple and yellow, there is partial blending of the two colors and very rarely a pure yellow. For example *pallida* x *aurea* produced eleven seedlings of which *Afterglow* was the yellowest; in F₂ with an outcross to a weak *pallida* a faint pink appeared which self-fertilized produced *Shekinah* (F₃ from *pallida*). *Shekinah* x *Afterglow* (F₁) has given a large proportion of yellows.

White is a recessive but it may be due to the absence of purple, or red which is purple minus blue, or of yellow and venation. Hence in F₁ we may get white as in *tectorum album* which is a true recessive, but we are more likely to get almost anything else because most of the whites are of extremely hybrid origin. There is an isolated case of a cross between *White Knight* and a white seedling which gave a big batch of all whites. In other crosses this seedling has given many yellows, but *White Knight* has not been tried out.

Again and again we meet these difficulties in our attempts to find in irises some analogy to real experiments with other plants.

Mr. Bliss has proved the following to his own satisfaction.

Crosses of *pallida* x *variegata* will produce the color variations commonly known as *amoena*, *neglecta*, and *squalens*.

Plicata is closely related to *pallida*, probably a "break" therefrom or perhaps a sort of albino.

The intercrossing of pure *pallidas* gives no advance whatever toward red.

The direct combination of *pallida* purple and *variegata* yellow in any proportions has no tendency to produce red.

There is a close and rather inexplicable association between *plicata* and redness. Miss Sturtevant concurs in this and finds also that depth of tone in a self is also in close association. *Dream* is partly derived from *Junata*, itself a deep-toned *pallida* with *plicata* in its ancestry and *Delight* which combines red and *plicata* (you might include white) is further down in the same line. It should be noted, however, that red, *plicata*, and white are all probably recessive if crossed with purple or yellow.

It would be helpful, perhaps, to state more didactically certain apparent "linkages" which I have already suggested even though they are indicated rather than proved empirically.

Pallida; color "partially dominant", selfing dominant with *plicata* only.

*"The Anthocyanin Pigment of Plants" p. 145, by M. Wheldale.

Plicata Mme. Chereau, recessive as to markings but apparently dominant as to height and pinched form of falls.

Variegata; color partially dominant only; venation dominant; velvety quality recessive. There seems a linkage between venation and height, often accompanied by flower form, velvet, and branching. It is odd too to find the light margin of the fall fairly constant among seedlings with even a distant trace of variegata.

Amoena; usually a variegata albino, occasionally variegata-pallida.

Neglecta; pallida-variegata or derived from germanica and trojana. These last two have been used for such a comparatively short time that their genetic influence is quite doubtful.

Squalens, blend; variegata with other strains.

germanica; dominant as a bicolor. Amas carries size and usually poor substance.

Trojana; branching dominant and bicoloring.

Cypriana, mesopotamica (Ricardi); usually carry size and height often accompanied by a flexuous stem and weak constitution.

Aphylla; Direct descent is rarely known, but we do find similar branching to the ground and a bluish beard which indicates its presence in the ancestry of as fine a variety as Mme. Gaudichau.

It must be remembered that the last four varieties have not been hybridized for a long period, in fact any deductions as to aphylla are as much conjecture as Mr. Bliss' suggestion that plicata had balkana in its ancestry. Without such guesses and our consequent attempts to prove or disprove them there would be no progress in the genetics of irises. At the least they greatly enhance the pleasure of hybridization.

THE PROCESS OF POLLENIZATION

And now for the mechanics of hybridization. The only requirement is placing the pollen grains on each of the three stigmas, but the age of the flower or atmospheric conditions may prevent fertilization. When the flower first unfolds the stigmatic lip (see cut) is tight up against the crest, but in the fully opened flower it curls down and forms a sort of shelf ready to receive the pollen. The stamens with their slender filaments and terminal anthers, like longitudinal envelopes, carry the pollen grains. Pluck the stamen with a pair of tweezers and transfer the pollen to the stigma; some shake the pollen into a vial, or pill-box and then dust the stigma with a pollen covered, small camel's hair brush, but I prefer to take the stamen between my fingers and scrape the pollen off on the stigmas. (the stamens of the flower to be crossed are previously removed). The first is probably preferable where indiscriminate wholesale crossing is practised, but the second is far simpler for more careful recording. In the bearded irises the chance of natural fertilization is slight and it is not necessary to bag the pollenized flower though many breeders break off the falls to reduce the chances of insect pollination, a short period of covering would be better. Miss Sturtevant considers that any injury to the petals is harmful as they tend to wrap themselves about the style-branches thus protecting the stigma and giving the sperm cells a longer opportunity to reach the ovary below.

Crossing should be carried on with newly opened flowers on a bright day as moist pollen even if obtainable does not seem to be potent, and a wet season means a poor harvest. Morning is the best time as the flowers open with the warmth of the sun and an iris stigma is not long in condition. If records are kept of the cross, a small tag may be

*"Studier ofer Anthocyanin" by O. Gertz.



Iris Nine Wells (Foster, 1909) a purple bi-color of Troyana parentage.

attached to the flower, or strip of paper pinned about the stem just below the ovary. Miss Sturtevant has developed a crossing book bound at the top and with parallel rows of paired numbers. These are divided from one another by perforations. The record is written on the stub and the corresponding number on its $2\frac{1}{2} \times 1$ inch slip is pinned about the flower. This greatly obviates the danger of an illegible record. Pencil on paper is sufficiently lasting. The value of records cannot be overemphasized.

A large percentage of crosses fail to set seed, some species and



**Iris Korolkowi and Iverna in a Massachusetts Rock garden.
A thin gravelly slope with a southern exposure.**

varieties rarely form pods, some never produce pollen, and some are infertile in both respects. Mr. Bliss, at least, considers that "exceptional flowers, showing a great advance on their parents have nearly always come from crosses that produced few seeds" in fact in one case only a single seed resulted from 500 attempts at pollenization. It is well to keep trying on a worthwhile variety as some varieties set seed in the south that rarely mature in northern gardens. It is most wise also to cross the finest varieties available at the start even though many a poor looking variety may have great value as a parent. "Like produces like" is an excellent slogan despite the fact that color, or some factor that you wish to perpetuate does not appear in the first generation. Definite excellence produces excellence might be a more accurate statement in dealing with hybrids which even if self-crossed may produce infinite variety and still be in accord with the laws of heredity.

Limitations in Hybridization. I have considered tall bearded irises entirely and perhaps a brief review of other possibilities, is desirable. The recent articles by Mr. Dykes in the report of the International Conference is most comprehensive though occasionally at variance with reports that have come to this office.

Hybridization between unrelated species is usually impossible and the resulting hybrids are frequently sterile; even within the same section, with pogoniris for example, crossing between plants of widely divergent character is difficult and may result in sterile progeny. This has been the case with cypriana-variegata crosses to a large extent in my experience.

The iris family is divided into the following sections and I append notes as to known crosses.

Apogon or Beardless; But three reputed crossings with pogoniris are known, one of which flowered and was lost. Within the groups sibiricas breed freely among themselves, with the California varieties, the spurias, the hexagona group, the Japanese, and laevigata each, as far as we know, with their own kind only. (Pseudacorus x Kaempferi and Kaempferi x hexagona have produced pods at least while Dorothea K. Williamson seems to cross with almost anything). Pseudacorus may be crossed with versicolor which varies much in itself, and a fertile cross has been made between sibirica and fulvala a hexagona hybrid in itself.

Evansia or crested; Few attempts at crossing have been made but there is one report of cristata x tectorum, and Loptec, a hybrid between tectorum and Loppio, a pogoniris.

Oncocyclus, Regelia, and pogoniris may be crossed freely resulting in some beautiful flowers and an increase in vigor with the admixture of pogon blood. Mr. Mohr has also successfully crossed reglio-cyclus x pogon which produced plants that approach a bearded iris in vigor. All these crosses are of great charm and well worth trying to grow; in general they show much of the coloring of the oncocyclus and the reglio-pogons are much less attractive.

The bulbous irises intercross quite freely but the progeny is often sterile. Within the **Juno** group there are species with three types of seeds, spherical, cubical, and with a pronounced aril. Members of the first two groups cross readily and create most attractive garden plants while the rare Rosenbachiana varies in color but does not cross with other members of the group.

Of all these wide crosses the Junos, the Reglio-cyclus, pogon-cyclus, and fulvala and the similar Dorothea K. Williamson are of real garden value where they may be grown successfully, while within the groups apogon and dwarf bearded seedlings are probably fully as desirable as most named varieties. Pogon-reglias are rarely pretty and others are often more curious than beautiful. You will find your greatest pleasure in breeding tall bearded irises without much doubt, as other crossing is beset with difficulties and, judging from the past, has not produced any great results.

Growing the Bearded Irises

J. Marion Shull

In attempting to direct the steps of the beginner into the paths that lead to Iris enthusiasm it is fortunate that the subject we deal with is so unusually tractable, so simple in its every essential requirement. Few of our cultivated plants are capable of giving so much in return for so little of care and attention as are the Bearded Irises. Many of the newer ones and some of the older are perfect gems of the flower world and yet they need neither deep digging nor extravagant fertility call their own, and at intervals of a few years a helpful thinning. What more could the garden lover ask? Any soil that will grow corn and is reasonably well drained will answer, and whether it contains much or little lime is apparently of small moment for they grow equally well in our coastal plain Maryland soils deficient in lime and in the richly lime-laden soils of Ohio.

The best possible soil conditions, however, are such as will be found in a good garden where manuring and thorough cultivation have been

maintained a sufficient number of years to produce a fairly rich soil practically free of serious weed pests. In weedy soils it is quite impossible to keep the clumps clean after the first couple of years and it may be necessary to reset at more frequent intervals than would otherwise be required. With such soil no fertilizer need be added, and under no circumstances should fresh stable manure be used.

How to plant depends somewhat on whether plants are obtained near at hand and are merely reset or have undergone shipping for some distance. The reset plant may have all its fine roots alive and uninjured, in which case it can be given its natural position which has been aptly described as sitting in the soil like a duck sits in the water, the roots spreading diagonally downward and the earth firmed over them providing all the anchorage they need. Safe shipping, on the other hand, requires drying off and many or possibly all the roots are sacrificed, in which case new roots must be sent out from the rhizome. So, if plants are received by mail, they need be set a little deeper but only deep enough to sit steadily in place and ought not to be wholly covered with soil.

The Bearded Irises have no truly dormant period except in winter but with their fleshy rhizomes to tide them over the hard places of the season they may be planted at any time without jeopardizing their lives, but the time of planting does affect them in their bloom. Flower buds are formed in late summer or fall and this fact determines the best time for planting or resetting. If planted in the spring the flower buds will either blight or come relatively weak and stunted. If planted too late in the summer but before flower buds have been formed there may not be sufficient time to root in and prepare for a spring blooming period. Thus it happens that the very best time for planting is right after the last blooms are gone, giving plenty of time to become thoroughly established and to lay down blossom buds for the coming spring. Commercial growers find it more convenient to handle the plants a little later as they are then in better condition for shipping, so that most such planting is done in August and September, the effect on the succeeding bloom then depending largely on whether or not the remainder of the year is a good growing period.

While the Bearded Irises are most effective in considerable masses of a single kind it is not necessary for the beginner whose funds may not be unlimited to buy plants enough to do this from the start. A more interesting plan is to secure single plants of some of the finer sorts and from these develop the clumps that your plans really call for later. It takes a little longer and calls for some thinking ahead, but what would be the fun of gardening if it were not for planning ahead?

It is not the intention here to suggest varieties but most catalogs now carry the numerical rating given by the American Iris Society and while these figures may not be final they are as yet the best guide available as regards quality. Referring to personal tastes as to color, etc., it is then desirable to secure as many varieties rating at 80 or above as the pocketbook will hold out for. At first these may be planted merely in a garden row about a foot apart and left undisturbed for two years. After blooming the second year they may be taken up and the rhizomes broken into as many natural joints as can be found with separate roots attached. The number will vary with the growth habits of the variety and may be as few as four or as many as forty. In the meantime the color and height characteristics and time of bloom will have been learned and can be utilized in planning the grouping of the clumps for garden effect. Plants in such clumps should not be set closer than eight inches apart at the start, and if the soil is fairly free of grass or

weeds they may continue undisturbed for from three to five years or longer, until the centers become too crowded to bloom well, in which case either the whole clump should be reset or the most crowded central portion may be removed, some fresh soil added, and enough new plants set in to restore good bloom. It is usually well to water newly set plants, not because they really need the water, for they may lie out in the sun like a cactus for months and still refuse to die, but merely to settle the earth firmly about their roots and hold them well in place till new roots are formed. If clumps are growing on the lawn the grass should be kept away some six or eight inches all around them.

If the element of surprise and uncertainty is desired in the Iris garden it may be secured by permitting pods of seed to mature on some of the best varieties, always remembering, however, that seed production is an exhaustive process and that unless seeds are desired it is better to snap off while still young all such pods as form, thus throwing all the plant's energies into making new rhizomes for the next year's bloom. The seed will ripen in July or August and is best allowed to dry and remain so until October when it should be sown about an inch deep in a seed bed out of doors. Most of the seeds will germinate the following April and when a couple of inches high should be carefully transplanted into rows wide enough apart to cultivate between and with the plants at least eight inches apart in the row. If good growing conditions prevail most of these will bloom the following year and while none of them may be as fine as the parent from which the seed came it may safely be expected that many or all of them will be quite different.

There are few "don't's" to be set down in regard to the Bearded Irises, the most important one being, don't fail to provide satisfactory surface drainage. Standing in watery hollows after rains and particularly in winter time, is almost certain to prove disastrous. And don't use any soggy mulch, or stable manure, about them at any time. If the soil is too poor to grow the prize winning blooms you would like to produce it is permissible to work into it some bone meal before planting and to give a light annual dressing each autumn afterward, but it is safest to use no other fertilizer of any kind. Stable manure and mulch are injurious for the same reason and in the same way that it is harmful to let them stand with their feet in water, too much moisture providing just the right conditions for the development of the bacterial rot of the rhizomes, the one really serious disease to which they are subject, but which is seldom very destructive if good drainage is secured.

And now in closing, just one word of warning: If you would avoid becoming an Iris enthusiast never let yourself acquire beyond the fifth variety—more than that will lead on and on into a veritable garden of enchantment.

Field Culture

Mm. Bretin Et Abrial

Extracts from an article entitled "Culture de L'Iris a Parfum" published in the report of the 1st International Conference. The authors investigated and reported on conditions in the three regions, Verona, Florence, and Seyssel in France where irises, particularly pallida, are grown commercially for perfume.

Altho at first irises were not planted in land adapted to other crops this is no longer the case. As with other field crops they have their place in the rotation and should follow a cereal or legume and never



A Field Planting on the Grounds of the Dept. of Agriculture at Arlington.

potatoes or sugar beets which make similar demands upon the soil. We noted two plantations, side by side, the one planted on potato land, the other succeeding grain. This last was in prime condition while the first appeared very poor, many plants had died and there was only half a crop.

The land is plowed in the fall or early spring and harrowed a number of times before planting. In the spring a dressing of manure is applied or better yet an annual legume is sown to be plowed under in late June or July. At planting time they use a complete fertilizer rich in potash or simply potash as the iris demands this. The last cultivation is in August at planting time but it is wise to cultivate only where the plants are to be placed as, at this season, freshly turned earth dries quickly and it is difficult to find moist soil. If it does not rain the roots will be very slow in taking hold if planted in the loose dry soil.

The rhizomes for planting are selected very carefully both too large ones and too weak ones being rejected. The field is marked off in lines about one foot apart and running from top to bottom and they plant the irises eight to ten inches apart in the lines. For the cultivator or horse cultivation the lines are spaced two to two and a half feet apart.

In and about Seyssel they attach great importance to the direction the rhizomes are planted, the cut end being always faced up the hill, the bud down. The position has nothing to do with the points of the compass but only with the slope of ground for if the growing tip is faced up-hill then in light cultivation the new roots may be uncovered which delays growth.

The piece of the rhizome carrying the bud should be short, not over two inches long, they are planted about two to three inches deep and well-firmed so that the wind will not disturb them. (As the leaves are cut on harvesting, they are short on the planted pieces).

If the soil becomes full of weeds the first cultivation is given in October and the following year one in the spring and one in the fall and sometimes another is necessary the next year altho usually by this time the ground is completely occupied by plants. The roots are harvested the second year having occupied the ground exactly two years. Both harvesting and replanting are done in August.

In Italy near Verona the irises are cultivated on a chain of limestone hills rich in fossils and covered with olive trees, and many are grown under the olives on the edges or slopes of the terraces. The two-year old rhizomes are harvested, peeled (they peel easily in August) and stored for a year in a dry place before sale. Old rhizomes are not fragrant tho the treated product maintains its odor for many years.

On Sowing of Iris Seed

J. Marlon Shull

A number of people have recently advocated the indiscriminate raising of seedlings by the amateur, and it must be admitted that there is no end of fun in it, and since that is the chief end and aim of gardening, so far as flowers are concerned, I suppose one ought not even to question the wisdom of such advice. Nevertheless it is with some misgiving that I too would contribute toward this end—there are so many "new" varieties that one hesitates at the encouragement of those who would produce still more, that may be offered to a long-suffering world without sufficient regard for what it already possesses.

But if you must raise iris seedlings in order to attain full happiness in your garden, then at least make some effort at selection of parents. It is true that plants with such mixed ancestry cannot always be relied upon to transmit such good qualities as they may possess to the succeeding generation—but good qualities must be possessed before they can be transmitted, and ninety-nine times out of a hundred if the parents are both inferior you may safely count on nothing but inferior or mediocre offspring and time and space in any garden are too precious to be squandered on these inferior things. Preferably both parents should be selected, because of some outstanding quality, and it adds greatly to the zest if some definite end or combination of qualities is aimed at. What matters if you never quite hit the mark? It is the purpose and the effort at creation that are their own sufficient reward.

But I did not set out to write a thesis on evolution or the ways and means of plant breeding, but rather to present the results of certain germination experiments that might be useful after the seed had been produced. Ordinarily I do not collect any seed except from definite pollinations usually with some distinct purpose in mind, and as a rule all other pods that set are broken off while still young, both in the interest of working only with pedigreed seed, and to prevent contamination of plantings by dropping of chance seeds among established varieties. Natural seeding and subsequent germination are not particularly common most years except among a few varieties, but it may occur, and in some seasons, for reasons as yet not well explained, such seed may be produced in considerable abundance. It follows that no one can guarantee plants true to name from clumps of considerable age if seed prevention or control has not been maintained.

Some time ago I referred to a strain of seedlings of *Trojana* pollinated by *Lent A. Williamson* in an effort to gain some knowledge of the probable parentage of that fine variety, one of whose parents remains unknown. Out of the seedlings have come the sister plants, *Morning*

Splendor and Julia Marlowe, as well as several others of superior qualities. All of this strain were so fine that they still remain in my garden for our own delight tho lacking the distinction necessary to warrant their dissemination. In the summer of 1921, an exceptional year for natural seeding in the vicinity of Chevy Chase, these plants produced a number of fine large pods and, breaking my usual rule, I allowed some of them to mature for the purpose of seed experimentation. The breeder who has tried year after year to secure a desired seed production from special plants and has failed utterly or has only secured a few seeds of doubtful appearance, can not afford to use such seed for germination tests. No known hazard may be taken with such. But I now had fine plump seed produced at the rate of fifty to a hundred to the pod, valuable perhaps but not because of what the plant breeder had put into them. Hitherto I had always sown the seed in October, after thorough curing, following in this the advice of the late Dr. Walter Van Fleet who had assured me as the result of his own experience that I could get as good results in this way as by sowing in the greenhouse and much better than by spring sowing.

But why October? Might it not be just as well to try Nature's own plan of sowing immediately on ripening? Would germination take place at once as with many other perennials? Should seed be cured, or sown fresh? Nature drops it from the pod uncured—but then the seed may lie for some time uncovered on the ground and get its curing, if that were necessary. It is said that rose seeds must not be permitted to dry off between taking out of the hips and planting—might not the long delayed germination of some Iris seeds be due to over curing rather than to mere perversity? It was with questionings of this kind that this seed was used.

Individual lots were divided, one portion being kept for October sowing and the other sown in July, with as much uniformity of treatment as possible. These summer-sown seed were planted three-fourths of an inch deep and the plot shaded to prevent severe drying. Two lots had been a couple of weeks out of the pod and appeared fully cured; one was scarcely cured at all, and another was intermediate in condition. This last lot gave the highest percentage of germination among the summer-sown seed, and the uncured seeds the lowest, less than 25%. As compared with the October-sown lots of the same seed, the difference is not enough perhaps to be of great significance, but the latter gave 50% germination to an average of only 38% for the summer-sown seed. Summer sowing did result in fall germination of a few seeds but these young plants, while remaining apparently sound through the winter, without exception were heaved out and perished in early spring. There would thus appear to be some slight advantage in the later sowing.

And now, having produced these plants by way of learning how best to handle better seed, no one could think of throwing them away before they bloom, so there they stand, hundreds of question marks, the answers due next June. Will they show the same fine qualities of their one known parent strain, the fragrance of Trojana, good height and size and general uniformity of color, and so suggest that pollen came from others of this selfsame family? Or will it prove that bees have carried pollen from remoter plants, perhaps the Williamson seedlings a little to the north, so introducing all manner of strange colorings among their own? Or, most improbable of all, should these have been self fertilized, what sort of Mendelian splitting might be looked for in this second generation from Trojana and Lent A. Williamson? Will some definite proportion turn out Trojanas? And others Lent A.'s? Or should these latter more probably hark back to still remoter things? But now I hear you say why all these questions when a brief few months

would make them quite unnecessary? Nay, that is true, but that would be to miss the very essence of garden satisfaction and not to speculate would spoil the fun of it completely.

Irises in the Garden

Although we may naturalize many of the beardless irises in open meadows the garden proper is the place best suited to their beauty, in fact a garden of hardy perennials with no display of irises is comparatively colorless between the last tulips and the first of the peonies. Ease of culture, display of bloom, and even their foliage are all strong recommendations for their inclusion and though a single variety may flower for only two weeks, selected varieties will be in bloom from earliest spring until almost mid-summer.

In the well-planned garden we consider not only the effect at one season but the successive effects that may follow one another throughout the growing season. As collectors we may have a solid planting, or garden of irises alone, but as a mere garden lover we must reduce our iris plantings to permit of varied combinations and successful succession of bloom. The smaller and the newer the garden the more should we rely upon "iron clads" as satisfactory and easy to grow as irises.

Though the Japanese irises require extra good soil and tilth to thrive, other beardless species and all the bearded varieties are suited to the average garden. In our planning we should consider first, succession, and second combination and in each case consider also not only the appearance but the cultural requirements of the plants. All the irises form densely clustered mats of rhizomes on the surface and hence neighboring plants must be either deep rooted or good fighters to exist. Furthermore the one thing an iris will not endure is overbearing shade.—it needs the hot sun of summer to mature properly. Consequently a large area given over to irises is barren of flower all the summer and fall and we find that a clump with a possible crop of twenty to thirty stalks is far easier to handle. They lend themselves to group rather than to line planting; a single three-year plant, or two plants which by then have formed a peanut-shaped group, is far better than a line which has either become smothered by surrounding growths or is a beaded chain. While in a block the leaf-sheaves point restlessly in all directions, in a clump there is symmetry due to their common origin and a distinctive verticality that is truly decorative. To hasten this effect we may plant three to five rhizomes or fingers (undivided clumps usually break up) with the growing tips pointed outwards. I do not decry bold masses of irises,—there is nothing more beautiful—but I do not consider the all-season garden the proper situation for them. Mass them along a special path or at the edges of the lawn but do not spoil the summer effect of the garden.

With the size of the planting decided upon I shall place them toward the front of the border, partly to allow them the necessary light and partly that I may enjoy the contrast of their bladed leaves and the outstanding details of their flowers. In front will come low perennials, the edging and ground-cover plants, and behind, tall things some of which may swing light sprays out and over the iris green while to the sides are flowers of intermediate height and restrained habit.

Phlox, veronica, and many beardless irises form a delightful transition between the grayed foliage of the bearded varieties and the height of a holyhock or a larkspur in the background. The tints of *Sedum* spectabile, the cut foliage of rue, or *Bleeding Heart*, and the well-formed leaves of *Heuchera*, or *astilbe*, make interesting contrasts to

one side. Somewhere there will be a group of Salmon poppies, their dying foliage hidden by misty clouds of Baby's Breath and further on the Sea Lavender (Statice) or the wand-like sprays of Aster laevis will reach far out over the frosted iris leaves. In front I can use close mats of dwarf mint, or speedwell, or the thicker pile of Phlox subulata, Clove pink, or Nepeta Mussini,—there are edging plants in quantity and all the thrifty ones may be used with irises. The hardy asters are perhaps the most adaptable of all perennials for close planting with irises and an all iris-aster garden is well-suited to those who are absent from their gardens in summer.

Perhaps the bearded irises that require just ordinary well-drained garden soil have been foremost in my mind because the beardless varieties with their smaller range of color and generally smaller flowers require a bit more food and moisture than some of us provide. Their foliage is taller, they must be planted further back in the border, and if we have the rich tilth that the big-flowered Japanese demand, we can select quite different neighbors. Tall things like larkspurs, Senecio, Bocconia (only one plant), and New England Asters appreciate these conditions while in front I should use astilbe, Japanese anemones, buttercups, globe flowers, and hemerocallis in all its yellow-toned varieties. Culturally and artistically these form delightful as well as enduring combinations and successions.

Now let us see what is possible in color combinations, never forgetting, however, that what we gain in bloom at one season we may lose at a later period. The easily grown irises permit of four seasons of bloom, the first three overlapping and the fourth, the Japanese, following peonies in fairly close succession. The fact that these last bloom with the larkspurs and require special culture often makes it advisable to let one or the other dominate the small garden.

Of the early, dwarf bearded irises that are obtainable in white and yellow and violet the deep purple hues are the most useful. We have lavender phlox, white arabis, yellow primulas, daffodils, and alyssum, many plants in many hues but none that are easily grown with a deep iris purple hue. These dwarfs vary to fifteen inches in height and even the phlox does not produce a more even sheet of color. In mid-summer their foliage is poor but they like frequent re-planting and if divided early, the new shoots are an excellent green. Raise them from seed and select your own colors.

Closely following these in season but taller and with larger blooms come the Intermediate irises which in turn are followed by varieties of germanica and cengialti origin so that within two or three weeks we have advanced from the dwarfs to the tall bearded that are the glory of the garden. In so short a period the flowering of varieties overlap continually so that I shall content myself with urging you to use plenty of tulips and Phlox divaricata for combinations. Claret toned Kochii and orange Troilius is striking, cerise tulip Rosalind with the lilac flushed Dorothea, the magenta hued Blue Star with the deep purple iris King George V, Clara Butt with Bluett, there are endless combinations of tulips with these irises.

With the last of the tulips we have reached the season when there should be irises of every color, the light ones in masses particularly in the distance, and the dark ones in smaller groups near at hand where we may study their intricate richness. With the exception of a red-purple, often described as wine color, and ignoring the disagreeable mixtures of dull purple and yellow, all the iris colors may be said to harmonize either with each other or with other flowers. With extreme care we can use blazing Oriental poppies, but the iris are so large and full of color in themselves that many of the perennials seem mere access-



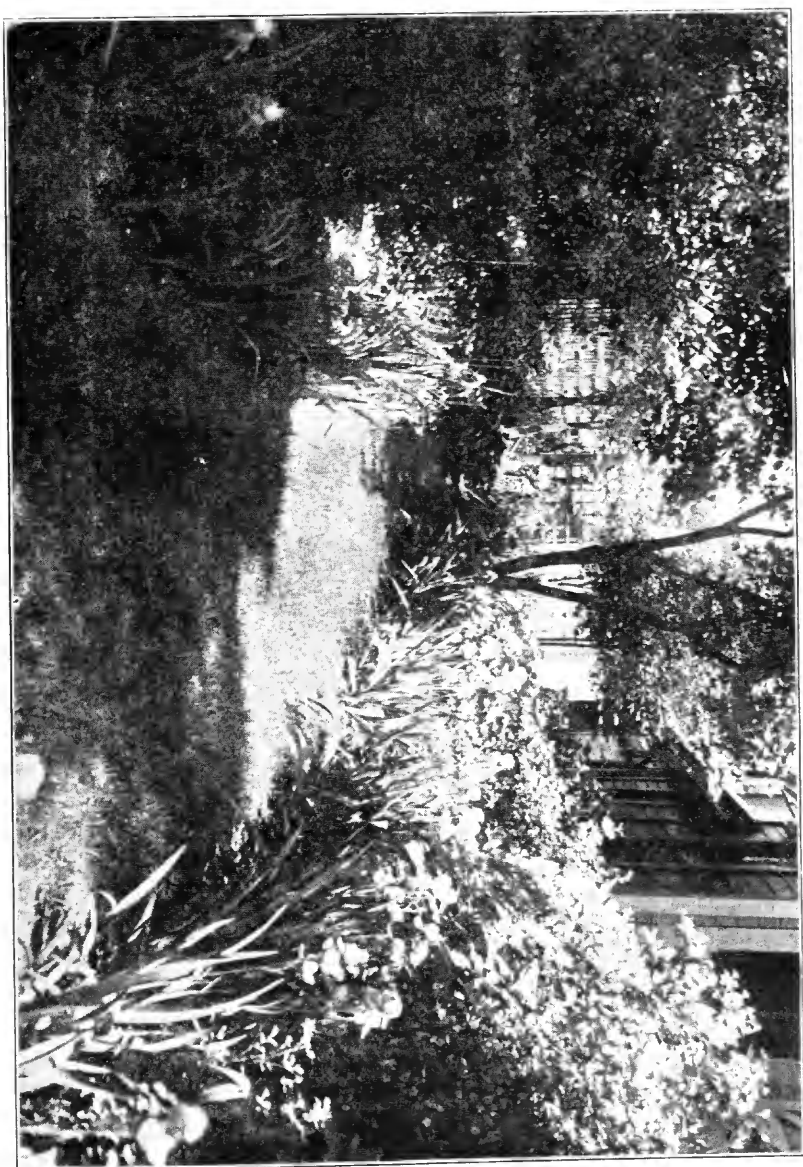
Pumila hybrid as an Edging. S. S. Berry, Calif.

sories and we are tempted to use a background of flowering shrubs, snowy spireas, blush cherries, yellow kerria, or fragrant Philadelphus. The varying heights lend themselves to such groupings and the use of Sibirica and other beardless varieties adds character as the flowers are small with an airy, butterfly sort of effect and the tufts of grass-like leaves make strong accents in yellow-green whereas the bearded iris foliage is mostly blue-green. Lupins are especially lovely with white sibirica and the blue of anchusa rising above white is equally good. I will list briefly a few of the many combinations possible.

In yellow; Dr. Bernice, Prestige, and Innocenza; Princess Victoria Louise, the color of its falls repeated in Caprice; Prosper Laugier and Shekinah; Iris King and Aurea; Sherwin Wright and Parc de Neuilly; Lorelei and Victorine; Aurea and wild columbine.

In purple; Perfection, Mme. Chereau, and Rangoon; Albert Victor, Tineae, Parc de Neuilly, and Victorine with Oriental poppies; Celeste or Perfection with Caprice; Rhein Nixe and Monsignor with White Knight and tall blue sibirica; Hiawatha and Thorbeck; Tristram and Autocrat; Du Guesclin or Chester Hunt with white and Sherwin Wright;

In the Garden of Mrs. A. Y. Smith, Indiana.



Dalmatica and salmon poppies; Chester Hunt with Parisiana; Patience or Lent A. Williamson with Premier.

In red-purple. Caprice and Flavesceus; Tamar and Shekinah; Polaris and Tristram; Dorman and Caprice; Ed. Michel and Pocahontas; Caprice and Eldorado; cream yellow is always better than white and nearly all red-purples need a good background of green. Curiously enough the cool pinks appear better under artificial light than a warm rose.

In rose and mauve; Archeveque and Pandora; Jeanne d'Arc and Caterina; Quaker Lady and Queen Alexandra or May Morn; Quaker Lady and Aurea; Her Majesty and White Knight; Dream and Dalmatica; Jeanne d'Arc and Pocahontas; Roseway and Rose Unique; Wyomissing and Dawn; Mrs. Alan Gray and Phlox divaricata; practically all these so-called pinks appear better with white or blue-lavenders like Dalmatica, Rodney or Bluet.

All these suggestions are for small gardens, in bigger plantings combinations should be much more simple, light and dark lavender with white or yellow for example, and made up of self-colored varieties of clear color. Bi-colors and blends do not carry well, in the first only the light standards may be seen from a distance and in the second the neutralized tones seem to melt into the shadows of the surrounding greenery.

Some day I hope to develop a long path with perennial borders to either side and here the irises, irregularly grouped will have their place. First will come rich red-purples in close harmony with lupins and lightened with tinted columbines, then pink and bronzed varieties with white lupins and evening primroses their pale yellow echoed in successive groups of irises beyond. Behind will be a touch of purple leaved plum or barberry. From pale yellow we will pass on to pure white and pink rising from a bed of phlox divaricata. Then the iris take up the lavender reins, there is a riot of shades of lavender and white culminating in the richest, darkest tones, the depth intensified by the shadows of a thorn that shades a seat. It will not be an iris border, nor a mere collection of varieties but rather the careful studying of related tones and contrasting forms. Such studies are most fascinating and as our interest grows we may develop yellow gardens or blue gardens, light ones or dark ones all within the range of iris colors.

Symposium of 1917-1918 Introductions

Compiled by C. P. Connell

In arranging the following ratings it has seemed advisable to omit all varieties which did not receive 5 or more votes, as such a rating should not be considered final. It is questionable also if the tabulation of the individual votes is of value and I have therefore given only the extremes. For ease of comparison we give in the first column the tentative ratings as published in 1922, and in the second the final ratings, in each case the first figure referring to the number of votes cast and the last to the average vote on a scale of 100 as perfection.

Miss Sturtevant recommends that the following varieties be discarded by all growers. Arabesque, Arethusa, Dainty, Elinor, Lugarda, Medallion, Purple-and-Gold, Whiffenpoof, and Zanzibar.

(B) Bliss; (B&A) Bobbink & Atkins; (D) Denis; (F) Fryer; (S) Sturtevant.

| Name | 1922 | 1923 | Range |
|---------------------|-------|-------|-------|
| A. E. Kunderd (F) | 8-58 | 16-63 | 50-80 |
| Afterglow (S) | 20-86 | 51-83 | 70-92 |
| Anne Leslie (S) | 17-83 | 40-77 | 50-90 |
| Avalon (S) | 6-91 | 8-87 | 80-95 |
| A. W. Blakely (F) | 2-60 | 5-61 | 55-70 |
| Azure (B) | 10-82 | 12-80 | 70-85 |
| Benbow (B) | 7-83 | 14-79 | 40-90 |
| Bluet (S) | 6-74 | 7-72 | 70-83 |
| B. Y. Morrison (S) | 17-88 | 31-85 | 70-95 |
| Camelot (B) | 7-81 | 12-79 | 65-85 |
| Clematis (B) | 9-78 | 21-71 | 40-88 |
| Demure (S) | 6-65 | 6-69 | 30-85 |
| Dora Longdon (B) | 13-81 | 13-78 | 60-85 |
| Dominion (B) | 12-94 | 24-91 | 80-98 |
| Dream (S) | 12-85 | 15-85 | 75-95 |
| Dr. Sanford (F) | 5-62 | 6-64 | 50-72 |
| Elinor (S) | 8-70 | 16-61 | 0-80 |
| Emir (Yeld) | 4-79 | 5-77 | 70-85 |
| Empire (S) | 10-75 | 11-75 | 60-85 |
| Golden Plume (F) | 5-48 | 12-52 | 30-70 |
| Gov. Hughes (F) | 8-71 | 17-71 | 55-95 |
| Grace Kimball (F) | 6-65 | 3-60 | 50-70 |
| Gules (B) | 6-73 | 18-71 | 40-82 |
| G. W. Peake (F) | 4-61 | 13-64 | 50-75 |
| Halo (Yeld) | 4-88 | 14-85 | 70-93 |
| Harriet (F) | 2-55 | 7-63 | 50-80 |
| Hope (S) | 5-63 | 6-73 | 65-80 |
| J. B. Dumas (D) | | 8-84 | 75-90 |
| Kathryn Fryer (F) | 7-81 | 14-80 | 50-88 |
| Knysna (B) | 10-78 | 24-76 | 65-86 |
| Lent A. William-son | 19-96 | 23-90 | 80-96 |
| Leverrier (D) | 7-90 | 13-91 | 85-95 |

| Name | 1922 | 1923 | Range |
|---------------------|-------|-------|-------|
| Magnate (S) | 5-78 | 8-78 | 70-85 |
| Margaret Moor (B) | 7-71 | 10-67 | 50-75 |
| Medallion (S) | 5-63 | 18-57 | 0-76 |
| Merlin (S) | 10-84 | 26-83 | 75-92 |
| M. G. Peters (F) | 7-66 | 13-65 | 50 85 |
| Mme. Cheri (S) | 8-83 | 11-84 | 80 92 |
| Morwell (B) | 6-82 | 18-78 | 40-91 |
| Mrs. Curtis (F) | 4-64 | 12-62 | 50-80 |
| Mrs. Fryer (F) | 8-79 | 18-71 | 60 88 |
| Myth (S) | 4-70 | 5-74 | 70-80 |
| Palaurea (S) | 8-68 | 7-72 | 65-80 |
| Paxatawny (Farr) | 7-71 | 3-77 | 70-85 |
| Primier (S) | 3-65 | 7-70 | 60-80 |
| Queen Caterina (S) | 14-90 | 41-91 | 83-96 |
| Rakan (S) | 5-65 | 13-60 | 0-70 |
| Ramapo (B&A) | 2-65 | 5-57 | 50-60 |
| R. C. Rose (F) | 8-53 | 15-52 | 40-75 |
| Rev. Smith (F) | 4-60 | 17-60 | 50-75 |
| Rev. Wurtelle (F) | 6-59 | 19-65 | 40-88 |
| Sarabande (S) | 10-76 | 10-70 | 0-85 |
| Shekinah (S) | 14-88 | 17-87 | 75-93 |
| Sherbet (S) | 11-81 | 9-81 | 75-88 |
| Sindjkha (S) | 13-83 | 10-84 | 75-91 |
| Swatara (Farr) | 7-78 | 12-79 | 70-85 |
| Syphax (B) | 7-75 | 17-73 | 50-90 |
| Wanaque (B&A) | 4-70 | 5-65 | 60-80 |
| Weequahic (B&A) | 3-63 | 5-60 | 57-65 |
| Whiffenpoof (S) | 6-63 | 20-62 | 40-79 |
| Wyoming (B&A) | 2-65 | 5-59 | 45-70 |
| W. F. Christman (F) | 4-71 | 11-63 | 55-70 |
| W. J. Fryer (F) | 7-84 | 17-83 | 70-92 |

Mr. Connell to whose good work we owe the above tabulation thinks that "on the whole the Society vote is a blind following of the jury vote except for a few cranks who went both low and high and so kept the average even. Most of the fairly well-known lesser things fell an average of 2 points; the conservatively rated "good" things held their own and in the case of Queen Caterina rose a point. There is a wide range of votes which I should call the result of freak voting as in the case of Merlin. On the whole there are so few votes that the thing does not seem worthwhile."

Personally I consider the results encouraging, Lent A. Williamson heads the 1917 list with 23 votes while Afterglow heads the 1918 list with 51 votes. Assuming that every member who voted at all judged these two varieties, a period of one year showed a decided increase in interest and I fully expect even better results this year. It is, however, still an open question whether the Society vote is worth more than a jury vote. With minor exceptions the two show little variation, certainly not more of a change than would be expected from added experience with a variety and an increased opportunity of comparing it with other novelties. It should be remembered that each meritorious introduction sets a new and higher standard for all similar varieties. E. G. In 1917 I rated Shekinah well over 90 but in 1924 with others comparable in color and habit I should rate it 10 points lower and eventually it may rate as low as 70.



**A Public Planting strip brightened with Irises from the Garden of
B. Y. Morrison, Washington, D. C.**

Another point worthy of remark is that all voters did not use the same maximum and minimum. They were conservative in awarding high marks, but only one used 0 as a minimum. If we do not hesitate to throw any variety out of the garden why should we hesitate to give it a 0 value? It should not be done without due consideration, a variety that we throw away should be worth nothing and our vote should represent our personal opinion.

The list of 1919 introductions is now ready and I trust that you will all make a point of sending in your votes. Read over the instructions accompanying the original Symposium (Bulletin No. 5) and vote even though you know only a dozen varieties.

We owe much to Mr. Connell for compilation and can best show our appreciation by giving him even more to do, an amusing contradiction.

The Work of the Society

(January 1924)

The American Iris Society was organized January 29, 1920, to promote the culture and improvement of the Iris and to serve as a central authoritative bureau of information on all phases of iris interest. Any one interested in Irises is eligible to membership upon payment of the \$3.00 dues and any five or more members may obtain cooperation in an exhibit. This policy alone has increased our membership from 250 to over 750 in our fourth year and has made it possible to stage over forty Iris Exhibitions throughout the country. In many cases these exhibitions were the first Flower Shows in their respective cities and we have, therefore, done even more for horticulture than for irises.

In 1920 there were a few books of a botanical nature dealing with irises and a few articles in current magazines. From March, 1920 to December 1923 the Society supplied The Flower Grower with one to two

pages of iris notes each month and there have been occasional articles in almost all the other garden magazines as well. In June, 1920, we issued our first Bulletin, a pamphlet of some twenty pages, this is our tenth. With the exception of the first, which is \$2.00 to non-members and \$1.00 to members, all the following Bulletins are available to gardeners at \$1.00 each (\$.50 to members). Their contents may best be judged by consulting the General Index.

No. 1. The Culture of Irises in the United States.

No. 2. Garden Irises, Past and Present.

No. 3. Sir Michael Foster and his work.

No. 4. Check List of Names of Current Varieties. Jan. 1922. Free.

No. 5. Symposium.

No. 6. Descriptions of Varieties Part 1.

No. 7. Part II. (These include various articles as well).

No. 8. Alphabetical Check List, complete to July 1, 1923.

No. 9. William Mohr (articles on Bulbous Irises).

In addition we have published a pamphlet on Exhibition Policy and Management and 5 x 3 Data cards for the official description of varieties. "Les Iris Cultives" the Report of the 1st International Iris Conference is also available.

We have established cooperative Trial Plantings of Bearded Irises at the New York Botanical Garden and at Cornell University, Ithaca, N. Y., and of Beardless Irises at the Brooklyn Botanic Garden. Our members have been forward in public plantings at Columbus, Nashville, Louisville, St. Louis, Memphis, Richmond, Kansas City and many smaller communities.

We have developed a bureau for the registration of the names of new varieties and have been foremost in the development of an International Committee to deal with this problem. This together with the publication of over 300 standard descriptions tends to regulate nomenclature and prevent confusion while the Symposium and score card set a high standard for future introductions.

This briefly has been the work of the Society in its first four years of existence and there is still work to be done that merits the cooperation of everyone interested in the perennial garden.

Wellesley Farms, Mass.

R. S. STURTEVANT, Secretary.

Cornell Iris Test Gardens

Austin W. W. Sand

The Department of Floriculture has been exceedingly fortunate in obtaining an excellent plot of ground for the investigation area, which includes the newly planted Cornell Iris Test Garden. This is located in a natural amphitheatre protected by hills on three sides and bordered by the main Ithaca-Syracuse highway along upper Fall Creek. The soil is "Dunkirk gravelly loam" conceded by the "U. S. Soil Survey" to be the best local trucking type.

A large number of varieties planted on this area in late fall, 1922, gave such good plants and blooms that the success of the new garden is assured. Single divisions made more than three plants for the permanent plot. The bulbous, beardless and rock garden sorts can be grouped in sections best suited to their requirements. Thus the local scope of the work has been materially widened.

The Test Garden has been designed and planted to make it especially convenient for study. Five foot beds with four foot grass walks and numerous cross walks divide it into approximately sixty or more sections, containing about twenty varieties, each in triplicate. Nine-

hundred of the possible twelve hundred sorts are in place. Along one side extends a series of twenty-eight fertilizer test plots. Each bed is planted to the following varieties typical of the bearded group. *Flor-entina*, *Flavescens*, *Honorabile*, *Sambucina* and *Celeste*. Suggestions from members interested in these fertilizer investigations are solicited. The experiments will be organized during the spring of 1924.

Since color classification has been a point on which few can agree, the tall and intermediate bearded sorts have been planted so that those relatively alike in color are in their respective groups. Varieties which are apparently synonymous have been planted side by side for further study.

The temporary grouping for color study follows the general scheme illustrated by the appended lists. This method grew from the practice of classing each sort studied as a self, blend, *plicata*, *bicolor*, solid or veined, suggested in the official Data Card. Associating these terms with the colors an observer will immediately note groups which are closely related in gradation of tints and shades while such a class when compared with another shows distinct lines of demarcation. It is the further study of these differences and the individuals of related natural groups which the writer feels should finally solve the problem of color classification.

Iris breeders should send their novelties to the test gardens of the American Iris Society before naming or at least before dissemination so that the investigational work can keep pace with progress and thus avoid the multiplicity of inferior varieties now being introduced. Many are only slightly different from standard commercial sorts and one questions their being worthy of a name.

The Society's gardens will be in a position to give accurate and prompt information provided its members co-operate in using them.

Brief of Color Groups

White: in effect, self-color. *Albicans*, *Florentina*, *Zua*, *La Neige*, *White Knight*, *Innocenza*, *Mrs. Horace Darwin*, *Fairy*, *Mary Minnanelle*.

Cream to Yellow: self-color. *King Christian*, *Empress Halfdan*, *Ingeborg*, *Ivorine*, *Helge*, *Etta*; *Flavescens*, *Foster's Yellow*, *Shekinah*, *Aurea*, *Empire*, *Magnet*, *Mrs. Smith*, *Sherwin-Wright*.

Yellow Bicolor: S. yellow, F. yellow to brown, *Enchantress*, *Montezuma*, *Samson*, *Marie Corelli*, *Mars*, *Bismarck*, *Camellia*, *Gagus*, *Mithras*, *Schiller*, *Mozart*.

Blended Bicolor. S. blended, vinaceous thru lilac and russet, F. velvety *bordeaux* to blackish purple. *Red Cloud*, *Opera*, *Arnols*, *Jacquesiana*, *Ambigu*.

Yellow Bicolor - veined. S. yellow and bronzed, F. claret-brown, purple and dull shades. *Pfaunauge*, *Maori King*, *Iris King*, *Navajo*, *Dr. Bernice*, *Kathryn Fryer*, *Prosper Laugier*, *Justinian*, *Goldbound*, *Fro*, *Mrs. Hayes*, *Honorabile*, *Mort Sanford*.

Yellow bicolor - blended falls. S. dull light yellow to yellow, F. lavender, violet, liseran purple to deep brown. *Mrs. Woodhouse*, *Princess Victoria Louise*, *Ossian*, *Loreley*, *M. G. Peters*, *Whiffenpoof*, *Gypsy Queen*, *Dejazet*, *Mme. Blanche Pion*.

Blends. *Afterglow*, *Eldorado*, *Nuee d'Orage*, *Sindjkha*, *Quaker Lady*, *Dalmarius*.

Plicata. *Anna Farr*, *Ma Mie*, *E. L. Crandall*, *Swerti*, *Mrs. Reuthe*, *Mme. Chereau*, *Blue Parfleur*, *Belle Hortense*, *Gysels*, *Mme. de Sevigne*, *Hebe*.

Lavender-white (True bicolors) S. lavender to white, F. light to velvety mulberry purple. *Dove*, *Rhein Nixe*, *Fairy Queen*, *Alice Barr*, *Penelope*, *Dona Maria*, *Anne Leslie*, *B. Y. Morrison*, *Mrs. Andrist*, *Thorbeck*, *Victorine*.

Pink self-color to intense purple. Rosalind, William Wallace, Windham, Cherubin, Wyomissing, Queen of May, Mt. Penn, Her Majesty, Rose Unique, Troost, Pauline, Standard Bearer, Caprice, Plumeri, Kochi, Dalila, Magnate, Tregastel.

Blue self-color to violet. Celeste, Mrs. Alan Gray, Cengialti, Dorothea, Jordaens, Tendresse, Leonidas, Princess Beatrice, Australis, Odoratissima, Penge, Frederick, Corrida.

Blended Violet self-color. F. purplish (bronzed) grading to deep violet purple. Attraction, Avenir, Khedive, Queen Caterina, Caterina, Trosuperba.

Dark Violet bicolor. James Boyd, Faustine, Massasoit, Chateaufort, Charles Dickens, Cottage Maid, Diane, Glory of Reading, Monsignor, Archeveque.

Dark Violet self-color. Rodney, Parc de Neuilly, Koya, Isola, Perry's Favorite, Crepuscule, Tom-Tit, King George V.

Violet Bicolor (Major type) *Violacea grandiflora*, Florentina Blue, Major, Firmament, Alcazar, Prince Victor, Fritjof, Salar Jung, Madcap, Amabilis, Arlequin Malinais, Amas, Nine Wells.

Blended, veined, or smoky bicolor. Incognita, Mikado, Louis van Houtte, Candelabre, Mephistopheles, Tamerlan, Poiteau, Mrs. Fryer, Iroquois, Igouf, Wanaque.

New York Botanical Gardens

The first organization meeting of the American Iris Society was held at the "Mansion" at the New York Botanical Garden in Bronx Park, the Trial Garden was initiated the following spring and Dr. Britton and his staff have proved both hospitable and helpful. The Perennial Garden is a series of irregular beds set along a pleasant tree-enclosed valley and the iris beds are on an open knoll near the main entrance.

Through the generosity of many members some five hundred varieties were planted in the season of 1920, others have been added each year including a large importation of standard varieties from France. All these are now well-established and, allowing for duplication, synonyms, etc. the total is close to nine hundred. There are also many seedlings sent for trial and still unnamed.

Last spring at our field day the garden was a lovely sight, the first plantings of three plants each had made heavy clumps which gave a fine idea of their value in mass and the last plantings of imported plants were showing sample blooms. There is much to be done in checking and comparison despite the good work of our New Rochelle members and either this year or next, the entire area must be replanted in accordance with some sort of classification. At present varieties are planted as received from different growers, the only practicable method for a beginning, but, with stock available, a better arrangement is possible. Through the kindness of Dr. Britton the Society has at its disposal surplus plants which may, perhaps, serve as a basis for other public plantings. The great need, however, is novelties and new introductions and we should be glad if interested members would let either Mr. Wister or me know what they have to offer.

Tid-bits

As The Flower Grower no longer serves as a medium of exchange between members it seems well to devote a page or two in each Bulletin to current notes and as I shall take every available opportunity to gather and redistribute these items among the members, our finances should prove the only stumbling block to frequent communication. Bulletins 10, 11, 12 and perhaps the Membership list, the announcements and reports of exhibitions will all offer chances to get together, and best of all we do not share our pleasure with the ignorant public. I feel sure that you will agree it must be ignorant not to be with us in our concern with the iris.

Before giving way to others let me say that the response to the garden questionnaire has already been splendid and proves beyond measure that we are not only interested, but imbued with the spirit of helpfulness towards other garden enthusiasts.

Can any of you assist me? I wrote and asked Mr. Rasay for suggestions as to what subjects the next Bulletin should cover and here is part of the reply.

"I do not know why my rhizomes grow so grandly big and fat and the leaves of the plants are so joyous in the bloom of health, and yet there is no hint of flower. Lent A. has lived with me for four years and is fat and gross beyond all reason yet never a blossom has he given me. Black Prince grew grandly for five years with no reward of bloom and then, this last season,—delighted my soul with seven stalks of wonderful flowers. Isoline the haughty flourished in her pride for three years with never a flower but in her fourth season she rewarded my bestow. And Whiffenpoof, a big, fat, flourishing plant has never even produced a blossom or a bud during the three years or more he has boarded in my iris hotel, yet on either side of him stand Nancy Orne and glorious Shekinah who delight my eyes and my very soul every season in showing what irises that are truly royal can do, and should delight to do, for the lover of lovely flowers and the glory of dear old Dame Nature."

In a letter to Mr. Boyd, Mr. Shull makes some rather good points as to novelties.

"I think you are justified in scrutinizing very closely every new offering that comes out and personally I have about decided in no case to purchase anything that I have not seen in bloom and been favorably impressed with. I think the solution, perhaps the only solution possible of the problem, lies in all of us abandoning the idea that we must forthwith include every new thing that is offered. In that case the price question would take care of itself, the really fine things would continue to command good figures, as they should, whereas the merely good and less would find their level in lessened demand.

"I am cognizant of the fact that the breeder not infrequently is apt to think too highly of his own "babies" and thru a perfectly honest enthusiasm tend to lead others into expectations that are likely to be disappointed. Then there are local differences hard to explain and still harder to forecast. It seems impossible to avoid some disappointments even with the best intentions.

"As to the host of English or other foreign registrations and the prices at which they are offered, they strike me as quite uncalled for and owing to climatic differences I do not expect many of them to make good on this side. Our best irises of the future must be selected under the conditions that prevail in this country if they are really to give service under those conditions so I expect the American breeder eventu-

ally to provide most of our really worthwhile things with perhaps an occasional survival of foreign sorts, and sometime the public will give over its inflated expectation of a variety just because it is of foreign origin."

A Note from Mr. Sass about a fall blooming seedling. It is a vigorous plant with large lavender flowers, the first fall it bore one stalk, the second six, the third sixteen, and this last September forty-three and it has also bloomed to a considerable extent each spring. As Mr. Sass reports no other varieties that bloom at this season, this seedling is particularly noteworthy as the yet unintroduced *Allies* is the only other variety of which I have heard such promising reports. With every such report of unseasonable bloom I wonder anew how I should live through a continuous iris season!

I am frequently getting requests as to where certain species of irises may be obtained and it is surprising how few growers list and can supply certain of them. When possible I always refer to a nursery, but it would prove a friendly thing if amateur members with surplus plants of species would let me know. Such an exchange often leads to much friendly communication. Personally I want *Iris Milesi* having read about it in *The Garden Magazine* this month and there is someone else who wants every species mentioned in *Bulletin No. 8*, quite an ambition but worthy of encouragement. I can see no reason why we should not run a list of "wants" and "offerings" and I can get the two together.

Mr. Duffy writes "I was glad to see your suggestion of a small committee to do the rating (Dec. Flower Grower), the only practical method. In an experience of twenty years as a sporting editor on various Chicago papers I met and used every day some system of point and percentage rating, grading, scoring, or handicapping and I think I understand the machinery very well. It was the universal experience, with no exceptions that I know of, that the larger the judging committee or jury the less satisfactory and conclusive the results for the reason that it seems practically impossible to induce any considerable number of citizens to work on a basis of agreed and mutually understood facts upon which judgment is to be rendered,—in short to talk the same language. It can't be done and the A. I. S. symposium, analyzed, indicates to me that possibly six or seven members are working on a common basis and the rest are stabbing around. In competent rating or judging committees working on a mutual agreement and understanding, the variation on personal opinion is normally not more than 15 or 20 points on a scale of 100, at most. It runs from 10 to 45 points in the symposium, in some cases I noted from 9 to 4.5, one judge rating an iris as 100% better than another. They are not talking the same language."

Mr. Schreiner writes "Yesterday I received *Bulletin 9* and was most tickled to see how closely the present mode of descriptions parallels my hobby—even to the point of recognizing the need of visualizing and comparison reference to other varieties. Although I should take issue with Mr. Sturtevant in saying *Mithras* is of the color of *Lorelei*. Such remarks as he makes closing description of *Mrs. Cowley* I consider particularly valuable. Would it not be an interesting exercise to have members send in their idea of description? From this glean the final standard description. Such a description symposium would bring out many points for interesting discussion and the more I think of it the more interesting possibilities I see in this theme."

I thoroughly agree with Mr. Schreiner, my descriptions may be improving but constructive criticism would be a great help. To date I have received minor comments and many words as to the absolute unintelligibility of *Ridgeway* color terms, this last what I should call de-

structive criticism as what else can we use for accurate comparison. Iris colors do vary, so does personal color sense but we can best keep our equilibrium on these spheres if they are flattened a bit by a standard color chart. There are times when I consider a description hopeless and then I sometimes actually identify a variety and my spirits rise.

Mr. Judson, Mr. Gowe, and the Sass brothers have just formed a garden club in Omaha. They wanted an iris one but as there were few other iris fans in the vicinity had to compromise on gardens which to my mind offers a far wider field for pleasant cooperation.

In sending in Odaroloc (the anagram for Colorado) for registration Mr. Andrews mentions that it is a seedling of a white plicata fertilized by another white seedling. As might be expected from such a cross it is a mauve to lobelia violet self of pallida habit except for the branching which is a distinct improvement over the close-held, high branch habit of the type. Mr. Andrews is one of the few breeders I know of who are interested in the genetics of irises and his careful work is, apparently, bringing results.

I hear that the Gladiolus Society is to follow our policy of four Bulletins a year including a symposium. When I consider the over four thousand varieties I feel as helpless as the promoters of a settled plan for our capital city of Washington. Perhaps you did not appreciate that we each and all are voting residents of Washington, D. C. inasmuch as its government is wholly in the hands of Congress and some eight or more uncoordinated committees thereof. A note to your congressman may help to remedy this red-tape and a vote on a symposium whether it is of gladiolus or iris will do much towards untangling the skeins of conflicting recommendations.

I expect the Membership List and another issue of Tid-Bits to reach you by March 1.

Announcements

Les Iris Cultives, the report of the 1st International Conference on Iris held at Paris in 1922 is now available with articles in English by Mr. Bliss, Mr. Yeld, Miss Ricketts, and your Secretary and many articles in French. I have had occasion to translate two for this Bulletin and you may expect to see others in the future. I should, however, be glad to order copies on request. With the present rate of exchange the cost is somewhere around \$1.00. It is a paper covered book of something over two hundred pages and with a number of illustrations.

Mr. Charles E. F. Gersdorff, Laurel, Md., whose reports on gladioli you may be familiar with has been appointed Chairman of the Committee on Registration. I hope that all breeders will send him notice of new names and that all growers will put him on their mailing lists for catalogs. Keeping the Check List up-to-date is not made any easier by having to write for such information.

The Sorcerer, an iris registered by D. L. Floore of Columbus, Wis., is probably but one of the many which we editors omitted from even the supplement to the Check List. I must also confess that the description of Trinidad in Bulletin No. 9 is entirely wrong, and that Mr. James Brown who grows so many bulbous irises is located away south of San Francisco and is not connected with Cottage Gardens, Inc. I am always

disgruntled at my errors in fact, or in proof-reading and I am continually running into them. As Mr. Wister wrote recently "I should like to read and re-read the Bulletins but every time I re-read it I find another mistake." It may be human but it is irritating to say the least. Furthermore "confession may be good for the soul" but I never did like things that were "good" for me.

And this last is not an apology but a strong plea. Please send me every possible detail about forthcoming exhibitions early, if not immediately, the announcements should be out by April 1st at the latest and it takes some time for me and the printer to do our parts. If you want the members to know about exhibitions send the information as soon as possible.

As a matter of publicity one local member may often obtain cooperation in an exhibit but **Cooperation in succeeding years** will depend upon the interest of five or more local members.

An announcement from the National Garden Association with which we cooperate as much as possible calls attention to the fact that **NATIONAL GARDEN WEEK** is to be celebrated April 20th to April 26th. As a national Society we can perhaps do little to forward the work but I hope that our members as individuals may prove of some assistance. Programs and leaflets may be secured from The Garden Magazine, Garden City, N. Y.

I hope to issue the Membership List before March 1.

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General Index

To 1st. Report of the International Iris Conference at Paris, 1922, and to Bulletins i to x inclusive of the Society. Reference is also made to the pamphlet on Exhibition Policy and Management. References in Roman numerals (small letters), e. g. iii, 7 refers to page 7 in Bulletin 3.

In compiling this Index I have tried to include all important references and to omit mere mentions of a name or subject accompanied by little information. As regards the 1st. Report, the Index is general only; Bulletins 1 to 9 are fully covered as to subject matter, and Bulletin 10 is covered in considerable detail. Please note that contributors and references to breeders and their work are listed separately.

I sincerely hope that the work has been done with sufficient accuracy and judgment to prove of assistance to members interested in special phases of the subject. We have touched on many subjects but much still remains to be done.

Abnormal Development. x, 14.
Alaska. i, 14, 17.
American Visits. iii, 20.
Amoena. x, 8, 26.
Aphylla. x, 26.
Apogon Section. see Beardless.
Arizona. i, 22.
Australia. ii, 33.
Autumn Flowering. x, 14, 17.

BEARDED IRISES

Bud Development. vii, 17.
Classification. 1st. 84-95, 100-120; vi, 23; x, 44.
Color. 1st. 84-95; vi, 11, 12, 23; x, 7, 14.
Cultivation. i, 6, 12; x, 32.
Culture. 1st. 150, 185-196; i, 10, 19; x, 30, 32. (see also Alaska, etc).
Culture of Irises in the U. S. i.
Cypriana. x, 26.
Descriptions of Varieties. vi, vii, ix, (list ix, 43.)
Descriptive terms. ii, 35; vi, 17; x, 20.
Disease. 1st. 203, 221; i, 4; x, 12.
Dwarf Varieties. 1st. 118; i, 3; v, 31; ix, 22; x, 8, 10.
Fertility of Varieties. 1st. 68; ii, 28; iii, 28; x, 11, 29.
Fertilizers. i, 7, 9, 10, 12; x, 11.

Field Culture. 1st. 185-196; x, 32.
Garden Notes. 1st. 156-174; i, 3; ii, 27, 30; iii, 12; ix, 22; x, 15, 36.
Hardiness. i, 12, 19. (see also species and localities)
History. 1st. 5-67; ii, 3-14; 18-25; iii, 7-17; ix, 3-7.
Hybridization. 1st. 68-99; i, 19; ii, 29; iii, 9, 14, 17, 28; ix, 8; x, 11, 24-29.
Intermediate Irises. 1st. 118; i, 3; iii, 14; v, 30; x, 8, 10.
Judging. ii, 35; v, 5; Ex.
Maintenance. x, 11.
Nomenclature. iv, viii; supplement. (see also Registration).
Propagation. 1st. 150; i, 20, 21; x, 11.
Ricardi as a Parent. ii, 25.
Seeds. x, 9, 34. (see hybridization).
Shipping. i, 10, 20; x, 6.
Soil. i, 5, 7, 8, 9, 12; x, 9.
Spacing. i, 6, 7, 10, 12; x, 6, 36. (see Culture also)
Symposium. ii, 37; v, all; x, 40.
Tall Bearded. i, 3; v, 23-28; x, 8, 10. (see general garden articles).
Time of Planting. 1st. 38; i, 5, 7, 8, 10; x, 6.
Winter Protection. i, 7, 12; x, 11.

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Californian. i, 11, 15, 16; ii, 24; x, 4.
 Chinese. ii, 25.
 fulva. i, 14; x, 4.
 General. 1st. 121-129; iii, 4; x, 8, 30.
 hexagona. i, 14; x, 4, 30.
 Hybridization. 1st. 68-73; i, 9, 14, 16; ii, 23; x, 30.
 Japanese. i, 7, 10, 11, 16; ii, 33; x, 8, 16, 37.
 missouriensis. i, 5, 15; x, 4.
 Native species. (see Alaska, etc.) i, 13; x, 4.
 ochroleuca. i, 9, 15; x, 8.
 Prismatic. i, 14; x, 4.
 setosa. iii, 5; x, 4.
 sibirica. i, 15, 17; ii, 23; x, 2, 8, 30, 37.
 spuria. i, 9, 15; ii, 23; x, 8.
 tripetala. i, 14; x, 4.
 verna. i, 13, 17; x, 4.
 versicolor. i, 14, 16; x, 4, 30.

Bibliography.

Abnormalities. 1st. 202.
 Diseases. 1st. 209, 211, 216.
 Medical. 1st. 181.
 Bicolor. x, 25.
 Blends, see classification. x, 8, 27.
 Botany. 1st. 47.
 Breeders, see separate list.
 Bud Development. vii, 17.
 Bulbous Irises. 1st. 141, 154; ii, 16; ix, 10-21; x, 8. (see species also).
 Culture. i, 21.
 Hybridization. 1st. 68-73.
 California. i, 8, 10, 11; ix, 2-9, 17.
 (see Breeder, Dean, Mitchell, Mohr)
 Californian Irises. i, 11, 15, 16; ii, 24; x, 4.
 Catalogs. x, 5.
 Cengialti. iii, 12; x, 8.
 Central States. i, 13, 17, 18; x, 4.
 Chinese Irises. ii, 25. (see Beardless)

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Classification. see under Bearded.
 Color Standards. **1st.** 84; vi, 11, 12; x, 20.
 Color combinations, etc. i, 3; v, 28; x, 38; 44. (see Garden Notes).
 Colorado. i, 5; x, 4.
 Crested Irises. **1st.** 68-73; i, 17; x, 4, 8.
 Culture. i, 9, 17.
 Garden Notes. ix, 23.
 Hybridization. **1st.** 69; x, 30.
 Native species. see cristata.
 cristata. i, 13, 18; ix, 23; x, 4.
 Cushion Irises. v, 32; ix, 4; x, 8.
 Culture. **1st.** 135, 153; i, 10, 18, 22; x, 8.
 Hybrids. **1st.** 69, 142; ii, 18, 28; iii, 4, 8, 13; ix, 5, 9; x, 30.
 Symposium. v, 32.
 Culture of Iris in U. S. i.
 (see under sections, Bearded, etc.)
 Cut flowers. **1st.** 166; Ex. x, 19.
 Data Card for descriptions available. vi, 17.
 dichotoma. ix, 17; x, 8.
 Descriptive terms, see Bearded Irises. x, 20.
 Disease. **1st.** 203, 221; i, 4; x, 12.
 Drug, Iris as a Crude. **1st.** 175, 185; iii, 27.

Dutch Irises. **1st.** 136, 148; ix, 15, 17. (see Bulbous).
 Dwarf Bearded. **1st.** 118; i, 3; v, 31; ix, 22; x, 8, 10.
 England. ii, 15-25; iii, 3-14; vi, 5; vii, 7.
 English Irises. **1st.** 146; i, 11, 21; ix, 10; x, 18. (see Bulbous).
 European Visits. **1st.** 13-28; vii, 3-12.
 Evansia Section, see Crested.
 Exhibitions, special pamphlet, x, 42, 48.
 Fertility of Varieties. **1st.** 68; ii, 28; iii, 28; x, 13, 29.
 Fertilizers. i, 7, 9, 10, 12; x, 11. (see Culture).
 Florida. i, 21; x, 4.
 Flower, parts of. x, 7, 24.
 Foliage. x, 21.
 France. **1st.** iii, 17; vi, 4, 8; vii, 3.
 fulva. i, 14; x, 4.
 Garden Notes. ii, 30-33; x, 36-40. (see under Bearded, etc.)
 Genetics, see Fertility, hybridization. x, 24-30.
 germanica. x, 8, 26.
 Germany. vii, 7.
 Germination of Seeds. x, 34.
 gracilipes, (Crested). i, 18; ix, 23.
 growth. x, 24, 46.
 History, see Bearded.

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Hybridization. List of Varieties used in ii, x, 24-30.

(see also Bearded, Bulbous, Crested, etc.)

Illinois. i, 9.

Information, Sources of. i, 3; x, 5.

Intermediate Irises. 1st. 118; i, 3; iii, 14; v, 30; x, 8, 10.

Japanese Irises. i, 7, 10, 16; ii, 33; x, 8, 16, 37.

Judging. ii, 35; iii, 5; Ex. x, 47.

Juno Irises. 1st. 68, 73; 138-140; ix, 18, 21; x, 8.

Kaempferi, see Japanese.

Labels. x, 9.

Lists. Recommendations. i, 3; 2, 27; iii, 4; ix, 10, 15, 18; x, 9.
(see Symposium)

Maintenance. x, 11.

Massachusetts. i, 12; iii, 24.

Medicine, Iris in. 1st. 175-196; iii, 27.

Bibliography. 1st. 181.

Membership Lists. Dec. 1921. Dec. 1923.

Additions. i, 23; ii, 40; iii, 30; vii, 35.

Minnesota. i, 7; iii, 21.

Missouriensis. i, 5, 15; x, 4.

Native species. i, 13; ix, 22; x, 3.
(see species and states).

neglecta. x, 8, 26.

New Jersey. iii, 22; ix, 22.

New York. i, 13; iii, 24.

" " Botanical Garden
x, 45.

Nomenclature, see Registration. iv, viii.

ochroleuca. i, 9, 15; x, 8.

Ohio. iii, 20.

Oncocyclus, see Cushion Irises. x, 8.

Oris Root, see Perfumery.

pallida. x, 8, 26.

Pennsylvania. iii, 20, 23; see also
Breeders, Wister.

Perfumery, Iris in. 1st. 175-196;
iii, 27.

Pot Culture. 1st. 150, 155, 167; x, 20.

Planting. x, 6.

plicata. x, 26.

pogoniris, see Bearded.

Pollination. see hybridization. x, 27.

prismatica. i, 14; x, 4.

Propagation. 1st. 150; i, 20, 21; x, 11.

pseudo-regelia. i, 19.

pseudacorus. x, 8, 5, 16.

pumila. see Dwarf Bearded. x, 8.

Regelia Irises, see Cushion. x, 8.

Reglio-cyclus. 1st. 133; i, 18; x, 27. (see Cushion, hybrids).

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Records. x, 9.
 Registration. iv, vii, ii, 38; 7, 37.
 x, 48.
 reticulata group. i, 21; ix, 21; x, 8.
 (see Bulbous Irises).
 Rhizomes. x, 21.
 Rocky Mountains. i, 5, 17; x, 4.
 Roots. x, 21.
 Score Card. ii, 35; v, 5; Ex.
 Seeds. x, 9, 11, 34.
 Selection of Varieties, see Symposium.
 x, 6.
 Self. x, 25.
 Setosa. iii, 5; x, 4.
 sibirica. i, 15, 17; ii, 23; x, 2, 8,
 30, 37.
 (see Beardless Irises)
 Society, Work of. x, 42.
 Soil, see culture.
 Spring Maintenance. x, 11.
 Squalens. see classification; x, 8,
 27.
 Spanish Irises. 1st. 144; i, 11, 21;
 ix, 10; x, 8, 30.
 (see Bulbous Irises)
 spuria. i, 9, 15; ii, 23; x, 8, 10, 30.
 Stalk. x, 22.
 Structure, see descriptive terms.
 x, 7, 20-23.
 susiana. i, 10, 22, see Cushion.
 Symposium. ii, 37; v, all; x, 40.
 Tall Bearded, see Bearded. x, 8,
 10.
 Time of Flowering. x, 14, 10.
 8, 10; x, 6.
 Time of Planting. 1st. 38, i, 5, 7.
 Trial Gardens. x, 42.
 Cornell. x, 43.
 New York. x, 45.
 tripetala. i, 14; x, 4.
 Use in Ornamental Planting. x, 15.
 trojana. ii, 13, 19, 21, 22; x, 27.
 variegata. x, 8, 27.
 verna. i, 13, 17; x, 4.
 versicolor. i, 14, 16; x, 4, 30.
 Wild Garden. x, 18.
 Winter. i, 7, 12; x, 11.
 Xiphium, see Spanish Irises.
 Xiphoides, see English Irises.

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For full list of breeders with addresses see iv, 5; viii, 215.
 Bacot, 1841. ii, 9.
 Bliss, A. J. 1st. 66; 74-81; iii, 28; vii, 9.
 Barr, Peter. 1873. ii, 13.
 Boissin-Louesse et Cie. 1860? ii, 3.
 Caycux et Le Clerc. vi, 9; vii, 3.
 Caparne, W. J. iii, 14; v, 30; vii, 15.
 Cleveland, Mrs. F. E. iii, 22.
 Clusius, Carol. 1601. ii, 3.
 Cumbler, Mrs. M. A. iii, 26.
 De Bure, 1843. ii, 7, 9.
 Denis, F. 1st. 65, 141-143; ii, 14, 25.
 Dykes, W. R. 1st. 68-73; ii, 14, 16; vi, 7; vii, 9; ix, 15.
 Farr, Bertrand H. 1st. 67; iii, 20.
 Foster, Sir Michael, 1836-1907. 1st. 65; ii, 15-25, 28; iii, 3, 4, 5, to 13.
 Fryer, W. J. iii, 22.
 Goos & Koenemann. 1st. 64; v, 30; vii, 6.
 Hort, Sir Arthur. 1st. 66; ii, 14, 15; vii, 10.
 Jacques, 1780-1866. ii, 7, 9, 12.
 Koehler, Frank. iii, 23.
 Krelage, Ernest H. 1st. 66; ii, 14, 15; vii, 10.
 Lauremberg, Petrus, 1632. ii, 5.
 Lemon, Victoire, 1840. ii, 8-14.
 McKinney, Mrs. C. S. iii, 23; ix, 22.

Millet et fils. 1st. 65; ii, 14; iii, 23; vii, 6.
 Mohr, William, 1869-1923. ii, 27; ix, 3, 8.
 Morrison, B. Y. iii, 25.
 Parker, Robert, 1875. ii, 13.
 Perry, Amos. ii, 13; vii, 8.
 Parmentier, 1830. ii, 8.
 Pele, 1841. ii, 9.
 Salter, John, 1798-1879. ii, 12.
 Sass, H. P. x, 47.
 Shull, J. Marion. vi, 11; vii, 17; x, 30, 34.
 Sturtevant, Grace. 1st. 67; i, 12; ii, 29; iii, 24; vii, 13.
 Van Houtte, Louis, 1859. ii, 10, 11.
 Van Ravenlingen, Francois, 1608. ii, 4.
 Van Tubergen, C. G. 1st. 132-140; ii, 18; ix, 13, 15, 16, 21.
 Verdier, Charles, 1863. ii, 11.
 Eugene, 1858. 1st. 64. ii, 11, 13.
 Victor. ii, 11.
 Vilmorin, Andrieux et Cie. 1st. 64; ii, 13, iii, 17; vi, 8; vii, 5.
 von Berg, E. 1782-1855. ii, 5, 6, 7.
 Wallace, R. W. ii, 21; vi, 5; vii, 8; ix, 13, 16, 21.
 Ware, Thomas. 1890. ii, 13.
 Williamson, E. B. 1st. 67; iii, 25; vii, 15.
 Yeld, George. 1st. 65, 96-98; vii, 11.

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